

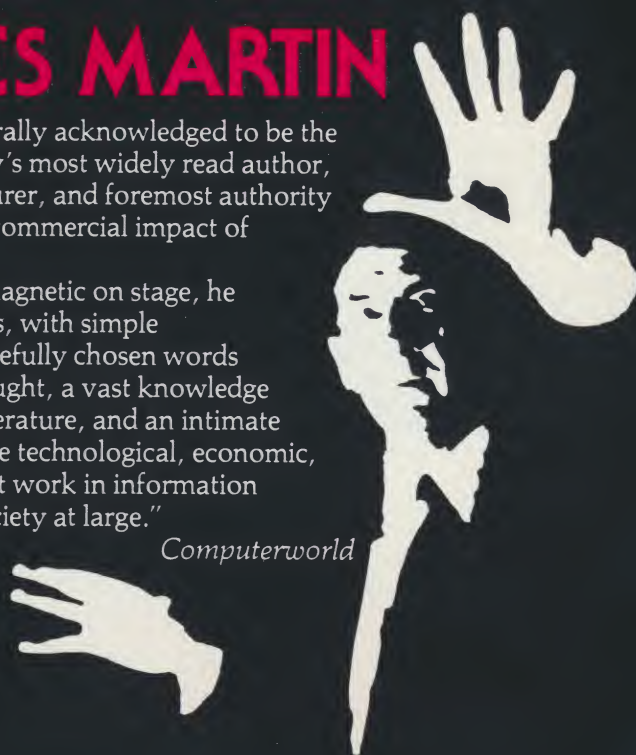
JAMES MARTIN

"The man generally acknowledged to be the computer industry's most widely read author, best attended lecturer, and foremost authority on the social and commercial impact of computers . . .

"Forceful and magnetic on stage, he speaks as he writes, with simple eloquence. His carefully chosen words reflect intense thought, a vast knowledge of the technical literature, and an intimate familiarity with the technological, economic, and social forces at work in information processing and society at large."

Computerworld

THE
PRODUCTIVITY
SEMINAR



FIVE INTENSIVE DAYS

ATLANTA	October 12-16, 1981
TORONTO	October 19-23, 1981
BOSTON	November 2-6, 1981
SAN FRANCISCO	November 16-20, 1981

SENIOR MANAGEMENT DAY

ATLANTA	October 12, 1981
TORONTO	October 19, 1981
BOSTON	November 2, 1981
SAN FRANCISCO	November 16, 1981

TECHNOLOGY
TRANSFER
INSTITUTE

741 10th ST. SANTA MONICA CA 90402 (213) 394-8305

FALL 1981

JAMES MARTIN WORLD SEMINAR

*"1000% increase in application creation
productivity is now possible."*



*Including a special one-day seminar for
Senior Management.*

One Day with James Martin THE SENIOR MANAGEMENT DAY SEMINAR

A fast-paced, one-day seminar for senior managers concerned with the effectiveness of their data processing.



- Corporate-Wide Strategies for Productivity
- Data Base and Distributed Processing
- Projections for Corporations of the Future
- Information Engineering
- Application Development without Programmers

SEMINAR-WITHIN-A-SEMINAR

This seminar-within-a-seminar is scheduled for the Monday session of each five-day course, and is designed to provide vital information for managers, CEO's, and planners. In addition, Senior Management Day provides an overview and introduction to the week-long seminar. This seminar will show attendees how they can help DP in its crusade to improve organization-wide productivity.

SENIOR MANAGERS SHOULD ATTEND THIS EVENT!

SENIOR MANAGEMENT DAY SCHEDULE

Atlanta	October 12, 1981
Toronto	October 19, 1981
Boston	November 2, 1981
San Francisco	November 16, 1981

Five Days with James Martin

THE JAMES MARTIN WORLD SEMINAR

PRODUCTIVITY THROUGH THE NEW DP REVOLUTION

- Fast application development
- Low maintenance costs
- Management strategy
- High end-user involvement
- Corporate-wide information analysis



"Without a doubt, the best investment any corporation could make."

—S. P. Corby, Toronto

FIVE-DAY SEMINAR SCHEDULE

Atlanta	October 12-16, 1981
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Aug 81

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741 10th ST., SANTA MONICA, CA 90402, (213) 394-8305

Productivity

Data processing and office techniques are now changing at a traumatic rate — a new DP revolution.

Some of the case studies show tremendous productivity gains in the best uses of the new techniques. However, to achieve such gains, **fundamental changes in methods are needed.**

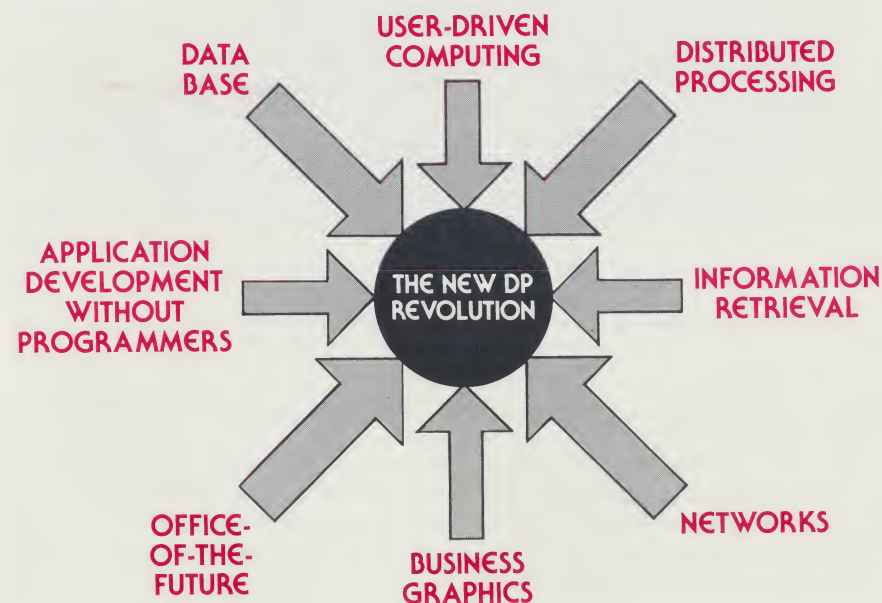
The new **hardware** involves distributed systems, new types of data base facilities, microcomputers, microfiles, intelligent networks, office-of-the-future facilities, business graphics terminals, new mainframe architectures, and communications satellites. Much of the driving force of this is the chip, with the number of components on a single chip doubling every year. Some powerful computers now cost much less than their programming staff. This hardware cost will continue to plunge while the people cost continues to increase.

New types of **software** permit fundamentally new means of application development — sometimes, **application development without programming.** Some (but not all) of this should be in the hands of end users rather than DP experts.

It is vital to understand that this technology requires new methods, new design techniques, new systems organization, and new patterns of management. **The methodologies of the 1970s will often prevent you from obtaining the massive productivity gains which the best case studies reveal.**

Ironically, in some organizations it is the DP staff who are clinging to old familiar techniques rather than changing their work culture.

Is your organization ready for the tremendous changes which are now happening?



Seminar Objective: Productivity

The James Martin Seminar has been structured to provide the insight, tools, techniques, and conceptual clarity needed to cope with the rapidly changing DP environment. Major new aspects of the seminar are its concern with **productivity**, including the session on application development without programming. The seminar will enable the DP staff to design clean, stable, cost-effective structures, and to avoid excessive future costs in revamping and reprogramming. Additionally, this highly pragmatic course will provide an overall management philosophy for corporate data processing.

Audience

The seminar is addressed to:

SENIOR MANAGEMENT DAY

- **managers** responsible for system decisions or strategy
- **CEO's and planners** concerned with new information resources

- **systems analysts and designers** who wish to learn the latest techniques of evaluation and design
- **programmers** seeking promotion to systems design positions
- **data base administration staff** who desire an understanding of how one designs clean, stable, logical data bases
- **teleprocessing and network specialists** wanting to understand emerging new techniques and needs
- **end-users** and their representatives in need of proper functioning DP systems, including office-of-the-future design

SENIOR MANAGEMENT DAY

Senior Management Day

Encourage your management to register and join you for the first day of the James Martin World Seminar. This day will be completely devoted to Senior Management issues. An overview of the new DP Revolution will be presented. This is intended to help delegates improve their communication with management and show senior management how they can help DP in its crusade to improve organization-wide productivity.

Why is this course exceptional?

The key to the success of this course is **James Martin**. *He is the world's best selling author of computer books, and has the unchallenged reputation as the world's finest lecturer in this field.* In an intensive five-day presentation, he will tie together the many vital aspects of systems design and show their interrelationship to each other.

This is a fast-moving, high-density program packed with information for every DP designer and manager. Each attendee will receive a complete set of class notes, bound in three volumes, which is carefully keyed to the lectures. The seminar is planned at the highest level of excellence, and is recognized as the best seminar of its type in the world.

James Martin

"Hypnotic on stage . . ." — Computerworld



James Martin is described in Computer Weekly as *"the computer industry's most widely read author and best attended lecturer."* He has written over 20 books on computer/communication technology. They are universally recognized as the most authoritative sources of information on data base, teleprocessing, telecommunications, interactive systems, and the impact of computers on commerce and society. He has appeared on radio and TV on all six continents. His recent book, *The Wired Society*, was nominated for a Pulitzer Prize.

James Martin was with IBM for 19 years, both in the field and in the development laboratories. He spent 10 years at the prestigious IBM Systems Research Institute in New York. He is presently an independent consultant. Amongst his recent work was a study for the chairman and president of one of the largest computer manufacturers on their corporate product strategy for the 1985 to 1990 timeframe. He is working at the chairman level with one of the world's largest office equipment vendors, and also a large common carrier.

He is Chairman of the Board of the DMW Group and Chairman and founder of Database Design, Inc. He is a founder and board member of a satellite television company, and is the creator of Deltak's Advanced Technology Library. Recently he was made a lifetime fellow of the ACPA for his contributions to DP education. He made the world's first educational course on Video-disk.

In the past, his predictions about technology have proved uncannily accurate. In 1960, he predicted the growth of teleprocessing, on-line storage, and real-time systems. Later he predicted the growth of microcomputers, communications satellites, and optical fibers. In his book, *The Computerized Society*, he predicted in 1968 that hobby computing would boom in 10 years. It did — in 1978. One of his books had a diagram of Viewdata five years before it was invented. He predicted the growth of value-added carriers, and was cofounder and Chairman of Graphnet, the first value-added carrier.

Course Summary

New technology will probably be that **single factor which most changes the way corporations are managed** in the next five years. Both its disruptive potential and its new opportunities make it vital to have a corporate DP strategy which is translated into action plans and design tools.

The rate of the technological change in the next five years will be astounding. It is vital for you to achieve a fundamentally **higher productivity in application development**. You will not achieve this through "structured" versions of old methodologies.

SENIOR MANAGEMENT DAY

The first day summarizes what is needed in order to achieve major changes in productivity. It stresses **information engineering** as opposed to traditional systems analysis.

The DP productivity techniques being taught in most seminars give improvements of 10% to 25% in practice (although higher figures are sometimes claimed). These will be reviewed and contrasted with techniques which give gains of 500% to 2000% by moving to **fundamentally different software and methods**. The new methods need new forms of DP management and systems analysis. They work least well where the classical DP development cycle, or structured variants of it, prevail.

We must employ new methods to serve the end users more efficiently, building systems which are truly flexible and accessible via networks, and easy to use. Such systems must be integrated into the "**office-of-the-future**" environment. One of the concerns when technology changes so fast is that conversion and maintenance sometimes become crippling. It is possible to build system structures and data structures which will minimize these problems and costs. Unfortunately, many system analysts are not doing that today. Some DP managers are digging a grave for themselves with system structures or software that cannot adapt, while their environment and user requirements are rapidly changing.

The course contrasts **user-driven systems** with systems which employ a classical development cycle. User-driven computing needs new software, new systems analysis techniques, and flexible data bases. Interactive prototyping may be used. Its early case histories are impressive. Much of data processing ought to use these techniques.

The foundation of most corporate and government data processing in the 1980s will be **DATA BASE**, and keys to success in data base will be explained. Data base is a foundation which you must lay today by building data structures which are clean and stable, which represent the inherent properties of the data, and which facilitate future distributed systems. The course describes the automation of data base design. **Intelligent data base** technology is contrasted with dumb data bases.

Whenever possible, data bases should be employed **without programmers**. Various forms of application development without programmers are described. They herald a major change in DP management.

To make the data bases valuable to end users, **networks** are necessary. Increasingly, these networks will serve distributed processing machines and office-of-the-future facilities. The networks will change rapidly. They need to be flexible and have standard interfaces to user machines. Many of today's network structures are likely to lock OUT user machines rather than making them easy to connect.

Network architectures will be discussed in detail. The new and varied public network facilities will be explained and contrasted with manufacturers' architectures. New types of networks will be analyzed, with attention given to TDMA satellites, IBM's SBS, Videotex systems, and local networks.

There are many different forms of **distributed processing**, and these will be detailed, along with their advantages and disadvantages. Distributed processing is occurring by default in some organizations, with scattered small machines conforming to no overall plan. To be effective, distributed or decentralized resources must be **PLANNED** with careful attention to users' needs and future evolution.

The **design** of distributed processing will be explained. It can bring great advantages to DP users, and is unquestionably the mainstream future direction of corporate and government computing. Like data-base and office-of-the-future technology, it needs careful design and management, and is fraught with human and political problems.

The course discusses **strategies** for the management and evolution of these environments, explaining what is likely to make them a success. Long-range data processing plans made with knowledge of future technology are crucial. Different methodologies for strategic planning are described, and experience with them contrasted.

Techniques now exist for 1000% improvement in application creation productivity.

These techniques require:

- fundamentally new forms of DP management
- revolutionary changes in systems analysis
- use of drastically different software
- end-user interaction and motivation
- new approaches to data base
- corporate-wide infrastructure planning
- senior management comprehension

Comments from previous attendees of the James Martin Seminar:

"For the cost of the seminar, you will receive a 10-time return in ideas, concepts and action plans."

M. J. Kravatz, New York

"Professional enrichment alone is worth more than the seminar fee."

Kelly Kim, Atlanta

"Saved me approximately one year of research and fact-gathering work required to establish the corporate EDP strategy."

Laurent Belly, San Francisco

"... this is on the top of the list for those who want their corporation to grow with the industry and not be left behind."

Rick Gale, Las Vegas

"You have presented in your seminar enough information on the future that would take me five years to acquire."

James McMurray, Los Angeles

"This is the best and fastest way for a user to get a real view of what he should expect for computerization in the future."

John W. Steen, Miami

"It gave me the opportunity and the ammunition to formulate guidelines for the direction my company should be following."

F. A. Bartow, Miami

"Excellent for management! Brings structure to thought process and reinforces importance of management role in EDP and strategic planning."

K. J. Schmidt, Los Angeles

"Well worth the bucks! If the opportunity avails itself — I will be back."

R. A. Cappellino, Chicago

Syllabus

Maximum benefit will be gained by attending the full five-day World Seminar. However, the first day has been organized as **Senior Management Day** so that non-technical managers may choose to attend the first day only, and will receive an essential introduction to the New DP Revolution. The subsequent four days will present the details of the technology, design tools, and methodologies.

SENIOR MANAGEMENT DAY

Monday

1. The Corporation of the Future

The use of computer-related electronics is changing rapidly in ways which greatly affect corporate productivity and necessitate the attention of senior management.

Vital technologies are rapidly *converging*: data base, distributed processing, information retrieval, office-of-the-future, and telecommunications. It is critical to have a corporate strategy for the integration of these technologies.

Computing facilities can now be made available at low cost to everyone in an organization. This necessitates *end-user-driven computing* with fundamentally new methodologies for application creation, but it also requires corporate-wide planning of an *integrated infrastructure* for networking, data base control, office-of-the-future *integration*, and information resource management.

Objectives of the technology ought to be to save two hours of every white-collar worker's daily time, improve operations efficiency, and give much better support for executive decision-making.

The corporation of the future will have office-of-the-future facilities combined with data processing on the same terminals. The facilities will be linked by corporate networks, and will be capable of accessing different forms of information resources. Almost all white-collar workers will participate in the use and, often, creation of these facilities. Such facilities cannot be

brought into efficient operation without top-down planning and senior management direction and support.

2. Future Technology Evolution

The development laboratories of the computing and telecommunication industries have never been so full of revolutionary new technologies as they are now. Some of the new technologies imply reversals of traditional strategies. The new directions portend an exciting future for systems designers, but could be a formula for chaos without disciplined and conceptually clean system design.

The plunging microchip costs imply that the programming and systems development methods of the 1970s cannot survive for most application development. New methods are coming into existence which give a 1000% improvement in the productivity of application creation. The move to new development methods, which this seminar describes, needs to be made rapidly and aggressively.

3. Data Base and Distributed Processing

The key to most of the new techniques for faster application creation is data base technology. Data base systems (as opposed to file systems) are rapidly evolving into new forms. These are explained.

Unfortunately, the spread of distributed processing and minicomputers can encourage local computing groups to design their own files. The same data then resides in multiple computers in incompatible forms. This causes great future maintenance costs and can prevent the most valuable uses of the data. The problem needs to be overcome by managing the data base environment in an appropriate manner, which can permit user-driven development where desirable, but which carefully controls the data design.

(continued on page 14)

SENIOR MANAGEMENT DAY (for all attendees)

8:30-10:00	10:00-11:15	COFFEE	11:45-1:00	LUNCH	2:00-3:30	COFFEE	4:00-5:30	BREAK	6:00-7:00
MONDAY REGISTRATION and COFFEE	MARTIN 1. The Corporation of the Future		MARTIN 2. Future Technology Evolution		MARTIN 3. Data Base and Distributed Processing		MARTIN 4. Strategies for Productivity		RECEPTION 5. Meet James Martin

CONTINUATION OF THE SEMINAR: DEVELOPMENT OF THE TECHNOLOGIES

DAY	COFFEE	9:00-10:30	COFFEE	11:00-12:30	LUNCH	2:00-3:30	COFFEE	4:00-5:30	BREAK	5:45-7:00
TUESDAY		MARTIN 6. Application Development without Programmers		MARTIN 7. The Information Center Concept		HOLLAND ROGERS MINSKY TYMES 8. Guest Lecture*		MARTIN 9. New Directions in Data Base: How Do You Plan for Them?		MARTIN 10. Question and Answer Session
WEDNESDAY		MARTIN 11. IBM's SNA Directions and Other Architectures for DDP		MARTIN 12. Open System Architecture and Public Networks		MARTIN 13. Tomorrow's Networks: The Brink of Revolution		MARTIN 14. Video Training Films		
THURSDAY		MARTIN 15. Fourth Normal Form. Automated Data Base Design		MARTIN 16. Intelligent Data Base. Data Base Stability Analysis		MARTIN 17. Strategic Planning Methodologies. Distributed Systems Tools and Techniques		KLEINROCK 18. Local Network Principles		MARTIN 19. Question and Answer Session
FRIDAY (seminar ends at 12:30)		MARTIN 20. Design and Strategy for the New DP Revolution		MARTIN 21. Top Management, Society, and the Future	*GUEST LECTURE: Robert Holland — Atlanta Ted Rogers — Toronto Marvin Minsky — Boston LaRoy Tymes — San Francisco			COURSE MATERIALS TO BE PROVIDED EACH ATTENDEE: Three volumes of course notes keyed to each lecture.		

The arguments related to different forms of distributed computing are summarized. Distributed systems need to employ data base technology. Planning is vital to create such systems, but without senior management support such planning often fails in implementation because of politics and parochial viewpoints.

A major problem with today's technology is that different machines and distributed architectures are often fundamentally incompatible. Top-down planning and design are therefore vital to make the pieces fit together.

4. Strategies for Productivity

Factors affecting productivity are discussed.

Techniques which bring major productivity changes are highlighted. Among the most important are application development without conventional programming where possible, fast prototyping, and software which permits fast turnaround for maintenance. User-driven computing is contrasted with conventional DP development. It greatly affects the productivity of how computers are used, but it must evolve within a controlled infrastructure. The jobs of the systems analyst change completely with user-driven computing.

The spread of minicomputers, networks, distributed processing, end-user software, office-of-the-future technology, and data base systems all make it absolutely vital to have a corporate strategy for their evolution. The strategy must be oriented to achieving major increases in executive productivity and a major speeding up of application development.

Strategy and strategic planning methodologies are discussed.

Major management changes may be needed to achieve the synthesis of office-of-the-future systems, DP, and corporate telecommunications.

How can the crippling costs and slow pace of maintenance of applications be dealt with?

The move to new forms of application development can achieve large increases in productivity, but creates a vital need for senior management comprehension, direction and support of corporate-wide DP strategies.

5. Reception

Meet James Martin.

Tuesday

6. Application Development without Programmers

James Martin has just completed a book of this title and believes that it represents a mainstream trend for future DP. It helps achieve *much* higher DP productivity, *fast* maintenance, and much better service to end users.

Programming in languages of the level of COBOL is a slow way to develop applications. Many diverse facilities are now becoming available which permit such programming to be bypassed for many computer uses.

Problems with conventional application development. Why the shortage of programmers will worsen.

New, non-procedural languages will be illustrated. These include data base query and report generation languages, application packages, application development facilities like IBM's ADF and DMS, and graphics packages.

The experience and problems with these new facilities will be discussed. In most cases, they require new forms of system design and management, and a fundamentally changed approach to application development.

Case studies showing large increases in productivity.

Machine performance considerations.

7. The Information Center Concept

User-driven computing may require highly professional work from systems analysts, but it avoids the classical DP

development cycle. It creates results for users quickly with new types of software. The users interact with the results, rapidly modifying them. An infrastructure which permits this is needed.

Case studies. Detailed illustrations of user-driven computing.

An explanation of the changes in DP management needed for user-driven computing. The *information center management* concept. A discussion of information center concepts. Why this is important. How they should be managed. Their connection to data administration. The concept of *information engineering*. What is needed to facilitate end-users creating their own applications?

The distinction between Class III and Class IV data bases.

8. Guest Lecture

At the Atlanta seminar, Dr. Robert Holland will discuss matching top-down data modeling with bottom-up data base design. He will also cover actual experiences that generally apply to corporations attempting to develop an integrated but distributed data base environment.

At the Toronto seminar, Ted Rogers will give a wide-ranging talk illuminating his prognostications about the future of telecommunications, broadcasting, and cable systems in Canada and the U.S.

At the Boston seminar, Dr. Marvin Minsky will discuss the writing of computer programs that have common sense. How to make a program behave sensibly without anticipating every potential problem is a main concern in modern research on the theory of artificial intelligence.

At the San Francisco seminar, Mr. LaRoy Tymes will explain the general principles of information transmission, and will give a detailed description of what happens to a single character from the time it is conceived until it is in the memory of a host computer.

9. New Directions in Data Base: How Do You Plan for Them?

Canonical representation.

Logical data structures.

Path dependencies.

Secondary keys.

Relational data base concepts.

Implementation of relational data bases. Why do relational enthusiasts believe these systems are so superior to systems using CODASYL and hierarchical structures?

System R and SQL.

DBMS's in hardware.

Secondary key mechanisms.

Building a search engine.

Associative memory.

ICL's Content-Addressable File Systems (CAFS). The implications of IBM Systems/38.

The impact of optical disks.

How can relational data bases be built into existing manufacturers' product lines?

Data interrogation and manipulation software.

Why distributed data base?

Data base extensions for distributed data and systems.

CODASYL's NDBMS.

How do you plan your DB structures so that they will survive changes in DBMS?

10. Question and Answer Session

A session for open discussion of attendee's own problems by James Martin.

Wednesday

11. IBM's SNA Directions and Other Architectures for DDP

Manufacturers' architectures for distributed processing will be discussed, illustrating the trend towards systems with geographically dispersed processing modules and the subtle complexities that such design introduces. The objectives of such systems and how they affect the end users are discussed.

The different architectures of several manufacturers will be described and compared.

Why layered architectures?

What layers are needed?

What functions should be in each layer?

Distributed system management.

Logical units, virtual terminals.

Control mechanisms.

Syllabus

Standards and incompatibility.
How will SNA, etc., relate to X.25?
The purpose of SNA in relationship to future IBM products.

12. Open System Architecture and Public Networks

ISO's Open System Architecture.
Functions of the seven layers.
The OSA in practice.
There are important and different categories of computer networks.
Alternate strategies in networking.
ARPANET.
Value-added common carriers.
GTE Telenet, Tymnet, Euronet, World-wide national networks.
GTE's Communications Network System.
CCITT network standards.
Datagrams.
Virtual calls and virtual circuits.
The need for separate layers in the software for intelligent networks.
An explanation of the new standard X.21 and X.25 interfaces.
X.3, X.28, X.29, and X.75.
Three generations of packet switching.
Politics and packet switching.

13. Tomorrow's Networks: The Brink of Revolution

PCM links.
T1, T2, T3, and T4 carriers, and CCITT equivalents.
Optical fiber systems.
AT&T's masterplan.
ESS 4/5, System X.
Superintelligent networks.
IBM's satellite subsidiary, SBS.
Networks with storage.
Distributed file and data base facilities.
Viewdata networks and applications.
Teletext services.
Videotex and other services.
SBS architecture and its implications (SBS is the communications satellite subsidiary of IBM, Comsat, and Aetna).
Why 12/14 GHz?
TDMA on satellites.

DAMA.
Burst switching and burst multiplexing on broadband channels.
Societal implications.

14. Video Training Films

Video tape and film provide complementary media to textbooks and seminars, and, in this session, examples of these media will be shown.

Thursday

15. Fourth Normal Form. Automated Data Base Design.

Normalization.
Third Normal Form.
Fourth Normal Form.
Stable and unstable structures.
Protection from future evolution.
Why should an IMS or CODASYL data base be in third normal form?
A description of canonical synthesis for design of data base structures.
Representation of canonical structures with today's software.
Conceptually clean data base structures are probably even more important than clean programming techniques such as structured programming.
Too many data bases being designed today are a muddle, and will have to be redesigned with great reprogramming costs.
The dangers of incompatibility.
What should be in a corporate standards manual for data base design?
This session gives the attendee a vital technique for designing data base structures that are stable and as likely as possible to survive future changes in hardware, software, and user demands. Both a manual version and a computerized version of the technique will be illustrated.

16. Intelligent Data Base. Data Base Stability Analysis.

Stability analysis: a key to data base success. Experience and management organization.
The distinction between production systems and information systems.

Data base performance.
Scheduling problems.
The use of end-user minicomputers in a distributed data environment.
Managing the data base environment. What has made it succeed? Tools, techniques, and management structures for success.
Intelligent data base systems.
Logic base and knowledge base.
The contrast of intelligent data base and dumb data base.
An intelligent data model.

17. Strategic Planning Methodologies. Distributed Systems Tools and Techniques.

Methodologies for strategic planning are reviewed. Experience with them is contrasted.
IBM's BSP (Business Systems Planning).
Subject Data Base Planning.
Entity Charting.
Entity supergrouping.
Affinity analysis.
The best of a set of methodologies.
How to organize for strategic planning.
Techniques for determining where data and processing should be located in a network: quantitative or qualitative method.
Data integrity, failures, restart, and check-points in a distributed data environment.
Security, privacy, and auditability in a distributed environment.
Conflict analysis: a technique for predicting integrity problems with distributed data.
Deadlock avoidance.

18. Local Network Principles

Dr. Leonard Kleinrock will discuss the fundamental principles of local data networks. These networks have exhibited an enormous growth in the past year and the details of this technology will be traced in his presentation. Included will be a treatment of the various network options, the media, the architecture, the access method, the performance and economic tradeoffs, and the various vendor offerings currently available. He will also

discuss the likely directions and impact of this emerging technology on future systems.

19. Question and Answer Session

A second session for open discussion of attendee's own problems with James Martin.

Friday

20. Design and Strategy for the New DP Revolution

The vital importance of having a long-range corporate plan.
Four components to the strategy: data resources, networks, distributed processing, office-of-the-future.
The data administrator and data base designers.
Distributed data base administration.
Management tasks in a distributed environment.
Conversion difficulties and strategies.
Migration.
Centralization versus decentralization.
What should be centralized?
The trade-offs.
How can distributed systems be managed?
An infrastructure for office-of-the-future evolution.
Integrated networks.
Levels of compatibility.
Network planning.
An infrastructure for faster application development.
Elements of a five-year data base plan.
Elements of a telecommunications plan.
Elements of long-range planning.
Elements of planning for a distributed environment.
Arguments for centralization.
Arguments for decentralization.
Designs which achieve the best of both centralization and decentralization.
Some data base data communications systems have been disastrous failures, whereas others have succeeded spectacularly. This session attempts to summarize the reasons for failure and success. The reasons for success can be repeated.

Syllabus

21. Top Management, Society, and the Future

What DP management should tell top management.
Top management's involvement.
Communication with top management.
Methodologies for top-down planning of corporate information systems.
Corporate restructuring because of new technology.
The aggressive corporation of 1985.

How do you build up the capability to compete in this environment?
Future directions of technology.
Convergence of office-of-the-future DP, and telecommunications management.
Networks of the future.
Future satellite systems.
The likely impact of future satellites.
Technologies now emerging will change the entire nature of management and society.

Guest Speakers

Leonard Kleinrock has that rare gift for explaining the infinitely complex in everyday language. He has an international reputation as the leading authority on computer networks. His two recent books are classics in the field. Dr. Kleinrock is Professor of Computer Science at UCLA. He received his Ph.D. from MIT, and has published over 140 papers. He is a Guggenheim Fellow, an IEEE Fellow, an IEEE Distinguished Lecturer, a member of the National Academy of Engineering, and has received numerous outstanding teacher and best paper awards.

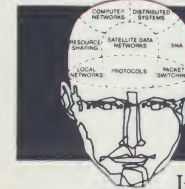
Robert H. Holland is the father of a new breed of methodologies for the automated design and documentation of distributed data base systems. As President and Chairman of Holland Systems Corporation, he directs all strategic client projects and is the primary architect of software to support application design. He was formerly the President of Database Design Inc. and Exec. V.P. of the DMW Group. Dr. Holland is a graduate of Virginia Polytechnic Inst., is an international lecturer, and has published widely on data base design, data resource management, and distributed processing.

Ted Rogers is Vice Chairman and Chief Executive Officer of Rogers Cable Systems, Inc., the parent company of Rogers-affiliated cable companies in Canada and the U.S. In the 1960's, he started Rogers Radio Broadcasting, Ltd., which acquired the nation's pioneer FM radio station in Toronto in 1960, and introduced FM stereo broadcasting to Canada in 1961. Mr. Rogers also founded Rogers Cable TV, one of the three pioneering ventures in cable in Toronto. Mr. Rogers attended Upper Canada College and the University of Toronto, where he received his LL.B. Degree.

Marvin Minsky is one of the most influential leaders in the field of Artificial Intelligence, emphasizing approaches to problems of symbolic description, knowledge representation, semantics, machine perception, and learning. Dr. Minsky was also an initiator of the modern field of intelligence-based mechanical robotics. He is currently Donner Professor of Sciences, Electrical Engineering and Computer Science Department, at MIT. He received his Ph.D. in mathematics from Princeton University.

LaRoy Tymes is currently senior scientist at Tymshare, Inc., where he is responsible for network development. In his 13 years at Tymshare, he has worked on the development staff for Tymnet, and on systems development for Tymshare time-sharing systems; been manager of Tymnet II development; designed the Tymnet engine; and worked on the development of custom LSI. He previously worked for Lawrence Livermore Laboratory and Control Data Corporation, and received his M.S. and B.S. degrees in mathematics from California State University at Hayward.

Announcements



SEMINARS OF EXCELLENCE

Offered by TTI: (213) 394-8305
FALL 1981 SCHEDULE

If you wish an in-depth treatment of various topics presented by James Martin, you have an unique opportunity to attend our Seminars of Excellence.

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October 26-28, San Francisco

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November 3-5, Boston

Database System Technology BERNSTEIN

November 4-6, San Francisco

Digital Image Processing and Analysis PRATT

November 16-18, Washington, D.C.

Computer Networks KLEINROCK

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November 30-December 2, San Francisco

Local Data Networks

SHOCH, WEIR, ROBERTS

November 9-11, Washington, D.C.

Integrated Distributed Systems POPEK, KLINE

November 9-11, Sunnyvale

SNA MARKOV, PIATKOWSKI

November 30-December 2,

Washington, D.C.

Software Engineering Economics BOEHM

December 7-9, San Francisco

DP SPECIALTIES

Data Base — The Second Wave HOLLAND

November 9-11, Chicago

December 7-9, Boston

X.25 and Other Protocol Interfaces to Packet Switched Networks

KARP, WEIR

October 12-14, Boston

November 30-December 2, Sunnyvale

IBM and Your DP Strategy LAMOND

November 30-December 3, Chicago

December 7-10, New York



741 10th ST, SANTA MONICA, CA 90402 (213) 394-8305

Technology Transfer Institute is an organization devoted to the presentation of top quality DP seminars and consulting in the fields of networks, communications, data processing systems, performance and management. Our approach is quite different from other seminar companies. We believe that the key element for a successful seminar is the lecturer! We have assembled the absolutely best talent available for the purpose of conducting the SEMINARS OF EXCELLENCE. (For brochures, contact TTI.)

Our seminars give you the tools and techniques that are known to work and which you can put into immediate practice. We teach more than tools; we emphasize understanding and principles. Our seminars are fast becoming the standard in the field against which others are measured. We urge you to attend one and see for yourself.

Books by James Martin

Published by and available from Prentice-Hall, Englewood Cliffs, NJ 07632, Phone (201) 592-2000

- Programming Real-Time Computer Systems
- Design of Real-Time Computer Systems
- Telecommunications and the Computer — second edition
- Teleprocessing Network Organization
- The Computerized Society (with Adrian Norman)
- Introduction to Teleprocessing
- Systems Analysis for Data Transmission
- Design of Man Computer Dialogues
- Security, Accuracy, and Privacy in Computer Systems
- Principles of Data Base Management
- Computer Data Base Organization — second edition
- Future Developments in Telecommunications — second edition
- Communications Satellite Systems
- The Informatic Society
- Viewdata, a Social Revolution (with David Butler)
- Computer Networks and Distributed Processing
- Design and Strategy for Distributed Processing
- An End User's Guide to Data Base

Reports published by and available from Savant Institute, 2 New Street, Carnforth, Lancashire, England, Phone 0524-73-4505

- Distributed Data Processing: The Opportunity and the Challenge
- Corporate Strategy for Distributed Data Processing
- Distributed File and Data Base Design: Tools and Techniques
- Computer Networks and Distributed Processing
- Distributed Processing — Network Mechanisms, Standards, and Recovery
- Architectures for Distributed Processing
- Distributed Processing Software and Network Strategy
- An End User's Guide to Data Base
- Managing the Data Base Environment, Volume I
- Managing the Data Base Environment, Volume II
- Strategic Planning for Information Resources
- Application Development without Programmers, Volume I
- Application Development without Programmers, Volume II

Video-Based Training Programs

Offered by DELTAK (312) 920-0700

DELTAK's Advanced Technology Library, produced in collaboration with James Martin. A comprehensive library of video-based programs and skills training products is available covering advanced technology subjects for executives, technical managers, and technical staff.

All of these programs feature James Martin on videotape. They draw material from his books and seminars. The subjects covered in the Advanced Technology Library include: distributed data processing and networks; telecommunications and data transmission; on-line and interactive computer systems; data base and data base management; system security, reliability, and performance; and office automation and the office-of-the-future.

Contact DELTAK for additional information.

Hotel Information

FOR THE JAMES MARTIN SEMINAR

The seminars will be held at the following hotels:

ATLANTA

October 12-16, 1981

SENIOR MANAGEMENT DAY

October 12, 1981

NORTHWEST ATLANTA HILTON

2055 South Park Place
Atlanta, GA 30339
(404) 953-9300
Single: \$58.00
Double: \$64.00

BOSTON

November 2-6, 1981

SENIOR MANAGEMENT DAY

November 2, 1981

HYATT REGENCY CAMBRIDGE

575 Memorial Drive
Cambridge, MA 02139
(617) 492-1234
Single: \$72.00
Double: \$87.00

TORONTO

October 19-23, 1981

SENIOR MANAGEMENT DAY

October 19, 1981

FOUR SEASONS HOTEL

21 Avenue Road
Toronto, Ontario M5R 2G1
(416) 964-0411
Single: \$80.00 (Canadian)
Double: \$100.00 (Canadian)

SAN FRANCISCO

November 16-20, 1981

SENIOR MANAGEMENT DAY

November 16, 1981

SAN FRANCISCAN HOTEL

1231 Market Street
San Francisco, CA 94103
(415) 626-8000
Single: \$58.00
Double: \$68.00

TO OBTAIN LODGING:

Participants must reserve their own hotel accommodations. Blocks of rooms have been reserved at all hotels; *they will be held for TTI attendees for up to four weeks prior to the start of the seminar.* In order to obtain the quoted rates listed above, you **MUST** call:

CMA Corporation (800) 556-6882

(The toll-free line is available Monday through Thursday from 9:00 a.m. until 8:00 p.m., and on Friday until 6:00 p.m., Eastern Time. Travel arrangements are also available through CMAC.)

You MUST mention The James Martin Seminar to receive the special rates listed above. TTI accepts no responsibility for hotel costs, reservations, or availability. **MAKE YOUR RESERVATIONS EARLY!**

Seminar Information

Five-Day Seminar:

Fee: \$1295.00 (U.S. Dollars) per person. Fee includes:

- Three volumes of course notes
- Luncheons and refreshment breaks
- Reception
- Certificate of Completion

SENIOR MANAGEMENT DAY

Senior Management Day:

Fee: \$350.00 (U.S. Dollars) per person. Fee includes:

- One volume of course notes
- Luncheon and refreshment break
- Reception
- Certificate of Completion

Registration Information

Complete the SEMINAR REGISTRATION FORM on the opposite page or the SEMINAR REGISTRATION CARD included with the brochure to reserve a place at the seminar. Mail to the TTI address below. A check made out to Technology Transfer Institute should be sent with the registration form, or be produced by the attendee at registration; failing this, an official purchase order is required.

Registration at the seminar will be from 8:30 to 10:00 a.m. on the first day. Lectures on that day will commence at 10:00 a.m.

Since the seminar is an integral presentation, no substitutes are allowed part way through the week. Substitutions may be made any time up to the start of the seminar at no charge.

Fall Seminar Giveaway: For each ten paid attendees your company sends to any of the World Seminar locations, an eleventh may attend tuition-free. (The same conditions apply to Senior Management Day.)

Cancellations received by TTI less than three weeks before the seminar are subject to a \$75.00 service charge. Registrants who fail to attend and do not contact TTI three working days prior to the seminar are liable for the entire fee.

These Seminars are *very* popular, and early application is strongly recommended.

Continuing Education Units (CEU)

The CEU is a standard measurement for noncredit continuing education programs. One CEU is give for each 10 contact hours of participation in this course.

Seminar Locations

The seminar will be held at the following hotels:

		5-Day Seminar	1-Day Seminar
Atlanta	Northwest Atlanta Hilton	Oct. 12-16, 1981	Oct. 12, 1981
Toronto	Four Seasons Hotel	Oct. 19-23, 1981	Oct. 19, 1981
Boston	Hyatt Regency Cambridge	Nov. 2-6, 1981	Nov. 2, 1981
San Francisco	San Franciscan	Nov. 16-20, 1981	Nov. 16, 1981

Full information about room accommodations and hotel addresses is located on pg. 21.

For additional information, please call:
(213) 394-8305

or write to:

**TECHNOLOGY
TRANSFER
INSTITUTE**

741 10th ST. SANTA MONICA, CA 90402, (213) 394-8305

Seminar Registration

Enclosed is a:

- ☐ Check for \$ _____ (U.S.)
(Five-Day Seminar — \$1295/person; Senior Management Day — \$350/person)
- ☐ Purchase Order No. _____

for the registrations listed below:

FIVE-DAY SEMINAR

October 12-16, 1981 Atlanta

November 2-6, 1981 Boston

October 19-23, 1981 Toronto

November 16-20, 1981 San Francisco

Seminar City _____	Name/Title _____
Seminar City _____	Name/Title _____
Seminar City _____	Name/Title _____

SENIOR MANAGEMENT DAY ONLY

October 12, 1981 Atlanta

November 2, 1981 Boston

October 19, 1981 Toronto

November 16, 1981 San Francisco

Seminar City _____	Name/Title _____
Seminar City _____	Name/Title _____
Seminar City _____	Name/Title _____

Organization _____

Address _____

City _____ State _____ Zip _____

Telephone Number () _____

Reservation Conditions

TTI accepts no liability for any consequences arising from opinions, views, or advice expressed by its lecturers. Topics may be moved from one session to another depending on time constraints.

Cancellation Liability: In the event of a cancellation of a seminar for any reason, TTI's liability is limited to the return of the registration fee.

It is a condition of accepting reservations for the above seminar that the proceedings will not in any way be automatically or electronically recorded. By my signature appended below, I confirm that I have read, understood, and accepted the conditions printed above.

Authorizing Signature _____ Date _____

**Mail this form,
with payment or
purchase order, to:**

Technology Transfer Institute
741 10th St., Santa Monica, CA 90402
(213) 394-8305

CODE: 0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N

FALL 1981 SCHEDULE

Technology Transfer Institute offers 15 Seminars of Excellence plus the James Martin Seminars. They are presented by over 20 of the leading world authorities in the fields of **Computer/Communications and Data Processing Systems.**

JAMES MARTIN WORLD SEMINAR

FIVE-DAY SEMINAR

October 12-16, 1981
October 19-23, 1981
November 2-6, 1981
November 16-20, 1981

Atlanta
Toronto
Boston
San Francisco

SENIOR MANAGEMENT DAY

October 12, 1981
October 19, 1981
November 2, 1981
November 16, 1981

SEMINARS OF EXCELLENCE

DP TECHNOLOGY

Performance Evaluation
DENNING

October 12-14, Palo Alto

Reliable Computing Through
Fault-Tolerance
AVIZIENIS

October 26-28, San Francisco

Queueing Systems
KLEINROCK

November 3-5, Boston

Database System Technology
BERNSTEIN

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Digital Image Processing
and Analysis
PRATT

November 16-18, Washington, D.C.

Computer Networks
KLEINROCK

November 17-19, San Francisco

DP APPLICATIONS

Capacity Planning
BUZEN, DENNING, SCHWETMAN

October 26-28, Washington, D.C.

Office Information Systems
CARLISLE, WATTEEUW

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Local Data Networks
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November 9-11, Washington, D.C.

Integrated Distributed Systems
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SNA
MARKOV, PIATKOWSKI

November 30-December 2,
Washington, D.C.

Software Engineering Economics
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October 12-14, Boston

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FALL 1981 6 DYNAMIC SEMINARS OF EXCELLENCE

COMPUTER

APPLICATIONS

CAPACITY PLANNING

BUZEN ■ DENNING ■ SCHWETMAN



OFFICE INFORMATION SYSTEMS

CARLISLE ■ WATTEEUW

LOCAL DATA NETWORKS

SHOCH ■ WEIR ■ ROBERTS



INTEGRATED DISTRIBUTED SYSTEMS

POPEK ■ KLINE

SNA

MARKOV ■ PIATKOWSKI



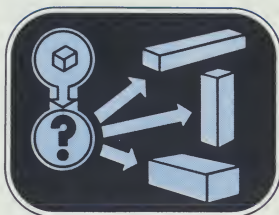
SOFTWARE ENGINEERING ECONOMICS

BOEHM

TECHNOLOGY
TRANSFER
INSTITUTE

741 10th ST., SANTA MONICA, CA 90402, (213) 394-8305

1. CAPACITY PLANNING



**A 3-DAY SEMINAR
OCTOBER 26-28, 1981**

**Registration: 8:00-9:00 a.m.
Seminar: 9:00 a.m.-5:00 p.m.**

**Springfield Hilton Hotel
6550 Loisdale Road
Springfield, VA 22150
(703) 971-8900**

SEMINAR FEE: \$695.00

CONTROLLED GROWTH

What will happen to your computer system when 30 new time-sharing terminals go on-line next month? When should that faster CPU be installed? Should you also order additional main memory, or would a high-speed drum be more cost-effective? These are the kinds of questions addressed in Capacity Planning, an important subspecialty of computer performance evaluation.

As a service for analysts engaged in capacity planning, Technology Transfer offers a comprehensive, state-of-the-art review. Jeffrey Buzen, Peter Denning, and Herb Schwetman are all outstanding lecturers with personal experience in the theory and practice of capacity planning. They have integrated their broad experiences into one seminar that spans all the topics used by successful analysts — how the theory works, how to obtain model parameters through measurement, and how to model real systems.

JEFFREY BUZEN

is internationally known for his theoretical contributions, including development of the central server queueing model, the convolution algorithm for queueing network evaluation, and operational analysis. He is co-founder and Vice President of BGS Systems, Inc., a Lincoln, Mass., firm that provides capacity-planning products and services to over 200 client organizations worldwide. Dr. Buzen directs the groups that developed three widely used software packages, BEST/1™ for performance modeling, CAPTURE/MVST™ for workload characterization, and CRYSTAL™ for performance management of the software development cycle. His Ph.D. is from Harvard, and he has been on the faculty at Harvard and Brown Univ. In 1979, he received the A. A. Michelson Award for outstanding contributions to computer metrics.

PETER DENNING

is one of the world's best known authorities on operating systems, is the originator of the Working Set Concept, and has made important contributions to process management and control, protection and security, resource allocation, and the effect of program behavior on system performance. He is Professor and head of the Computer Sciences Department at Purdue University, received his Ph.D. from MIT, and was on the E.E. faculty at Princeton University. He is President of the ACM; was Editor-in-Chief of *Computing Surveys* and Editor of the *Elsevier Series on Operating and Programming Systems*; has published over 70 articles and book contributions; has co-authored two books, *Operating Systems Theory and Machines, Languages, and Computation*; and is working on *Computer Language and Architecture* (with J. Bouhana) and *Understanding Performance Evaluation* (with J. Buzen). He has received two best-paper awards, a faculty teaching award, and an ACM recognition-of-service award.

HERB SCHWETMAN

has been involved with operating systems and performance evaluation for over 10 years. He is currently Associate Professor in the Department of Computer Sciences and Staff Consultant in the Computing Center at Purdue University. He has developed and taught a graduate course on models of computer systems, both at Purdue and at the University of Helsinki, where he was a visiting lecturer. He serves as Associate Editor of the Systems Modeling and Performance Evaluation Department of CACM. His Ph.D. is from the Univ. of Texas, Austin.

BUZEN ■ DENNING ■ SCHWETMAN

SYLLABUS

MODELS

**MODELING, VALIDATION, AND
PREDICTION**

FUNDAMENTAL LAWS

SATURATION AND BOTTLENECKS

**COMPUTATIONAL ALGORITHMS
FOR QUEUEING NETWORKS**

EXAMPLES

CASE STUDIES

**MODELING, BENCHMARKING, AND
SIMULATION**

**TRANSACTION PROCESSING
SYSTEM**

**BATCH PROCESSING AND TIME-
SHARING SYSTEMS**

VIRTUAL STORAGE SYSTEMS

**EFFECTS OF CHANNEL AND
CONTROL UNIT CONTENTION**

MEASUREMENTS

DATA GATHERING

WORKLOAD CHARACTERIZATION

WORKLOAD FORECASTING

**PARAMETERS FOR SYSTEM
MODELS**

PURPOSE

This seminar spans the range of technical skills and concepts that underlie successful capacity planning.

DAY 1: Peter Denning will introduce the basic theory of performance modeling and prediction. He will explain the fundamental operational laws that govern the performance of all computer systems. He will show how to use these laws to evaluate the effects of changes in such factors as CPU speed or number of time-sharing terminals. He will also explain and illustrate the algorithms for evaluating queueing network models.

DAY 2: Jeffrey Buzen will illustrate with case studies how a skilled analyst applies the techniques presented in Day 1, together with judgment and intuition, to solve capacity-planning problems. The extended examples include batch processing, time-sharing, and transaction processing systems. Benchmarking, simulation, and modeling packages will also be illustrated in these case studies.

DAY 3: Herb Schwetman will discuss the principal methods for measuring and forecasting the values of parameters needed to use the models developed in Days 1 and 2. Classification of workloads into classes of jobs will be presented. Several examples of models of real systems are shown. There will be a discussion of practical performance evaluation for several systems, including IBM, CDC, and Burroughs systems.

In addition to the course notes, each attendee will receive a copy of the September 1978 *Computing Surveys*, a special issue on queueing network models of computer systems.

AUDIENCE

This seminar focuses on the techniques of applying queueing models and collecting data for their parameters. It is about *how to use models* in practice. This seminar is intended for working performance analysts and capacity planners. A background in math or a degree in computer science or electrical engineering is helpful but not required. Please bring a pocket calculator. If you are primarily interested in *how and why models work*, you should consider the Performance Evaluation seminar (see page 2 of the Technology brochure).

2. OFFICE INFORMATION SYSTEMS



A 3-DAY SEMINAR
Registration: 8:00–9:00 a.m.
Seminar: 9:00 a.m.–5:00 p.m.

OCTOBER 26–28, 1981
Twin Bridges Marriott
U.S. 1 and I-395
Washington, D.C. 20024
(202) 628-4200

NOV. 30–DEC. 2, 1981
Sheraton Fisherman's Wharf
2500 Mason Street
San Francisco, CA 94133
(415) 362-5500

SEMINAR FEE: \$695.00

JAMES CARLISLE

is President of Office of the Future, Inc. (OFI), one of the world's leading firms specializing in the implementation of office automation systems for top management. Office of the Future, Inc. has been involved in the development of management communication and control systems for more than a dozen multi-billion-dollar organizations in the U.S. and Europe. Dr. Carlisle's current responsibilities include strategic planning, custom design of executive workstations, and user interfaces for access to distributed office information systems. His research at Yale, Rand, USC-ISI, and OFI, under ARPA and corporate sponsorship, has focused on the human and organizational issues in the design and implementation of office automation. Prior to forming OFI in 1977, Dr. Carlisle was Vice President for Office Systems Planning Corporation, Assistant Professor at USC, and Research Scientist at the USC Information Sciences Institute. He holds an engineering degree from Princeton and a doctorate degree from the Yale University School of Organization and Management.

CAROLINE WATTEEUW

is Vice President and Director of Consulting for Office of the Future, Inc. She is responsible for systems design, implementation, forms processing research, and coordination of an international network of consulting associates. She has consulted for DEC, Standard Oil, Westinghouse, and other large multi-national firms. She is the editor of the Auerbach publication *Electronic Office*. Previously, Ms. Watteeuw worked for Hoffman La Roche, where she was in charge of laboratory/plant automation and data communications networks, and for the University of Pennsylvania, where she developed on-line control strategies for genetic engineering processes. Ms. Watteeuw received her degree in Computer Science from the University of Ghent in Belgium, and her MSE in Chemical and Biochemical Engineering at the University of Pennsylvania.

THE MYTH OF TECHNOLOGICAL COSTS

The most important developments in office automation, which users have been anticipating for the past six years, are finally beginning to emerge. Those developments are the announcement by leading vendors of the information systems architecture for the 80s. Vendors have finally laid their cards on the table and have committed themselves to the development of products in network architectures to support their hardware and software.

Technological expenditures are increasing faster than technological costs are dropping. Financial expenditures on office information systems and services are the fastest growing sector of government and corporate administrative expense. What makes this situation particularly critical is that very few corporations have a strategic plan even for the components of office information systems, let alone for the collective mass of information systems. Few organizations have developed a coherent policy to guide and control these office information systems expenditures. Even worse, most companies are unable to keep up with the newest developments in office information systems.

CARLISLE ■ WATTEEUW

SYLLABUS

CONDUCTING AN INTERNAL AUDIT OF OFFICE SYSTEMS

SELECTING HIGH PAY-OFF APPLICATIONS
COST-JUSTIFICATION
WORD PROCESSING
ELECTRONIC MAIL
TRANSACTION SYSTEMS
DBMS

GRAPHICS THE HUMAN INTERFACE: PROBLEMS AND SOLUTIONS

USER INTERFACES
MULTIPLE SERVICES AND FUNCTIONS
INTELLIGENT TERMINALS
PRE-PROCESSORS
ENGLISH-LIKE COMMAND LANGUAGES

THE ROLE OF NETWORK INFORMATION SERVICES

CORPORATE AND PUBLIC DATABASES

INTER-COMPANY TRANSACTIONS ELECTRONIC MAIL

MULTI-MEDIA MESSAGE SYSTEMS
VOICE
TEXT
DATA
GRAPHICS

EXPECTED TECHNOLOGY BREAKTHROUGHS

DISPLAY SCREENS
LOCAL OPTICAL DISK STORAGE
DESK TOP LASER PRINTERS
HIGH-LEVEL PROGRAMMING
ROLE OF PERSONAL COMPUTERS AND MANAGER WORKSTATIONS

BENEFITS
IMPLICATIONS
CASE STUDIES
VENDOR PRESENTATION OF SYSTEMS ARCHITECTURES

PURPOSE

THERE ARE TWO UNIQUE FEATURES TO THIS SEMINAR: (1) a presentation by six leading vendors: an executive-level summary of the office system architecture for each will be provided by senior product strategy managers and leading-edge users, and (2) drawing on their broad experience designing and implementing office information systems, the seminar leaders will illustrate each session with real-life case studies from numerous pioneering management and professional users of office automation systems.

The purpose of this seminar is to cover the major steps and issues that any organization should address in planning for the integration of office systems. Understanding the critical differences in office systems architectures, as well as the potential areas of compatibility, is one of the most fundamental things planners should know.

There exists a new arena of possibilities: how to interconnect the different pieces of equipment and the different sub-systems in the automated office. Once the wiring is in place and the initial users have been introduced to the world of office automation, is there going to be any way to control system costs, purchasing decisions, and applications development, or will the whole system just take off and run out of control both economically and technologically?

AUDIENCE

This seminar is intended for those who must make planning and selection decisions with respect to emerging office automation technologies and systems. Although not required, a technical, data processing, or telecommunications background would be helpful. This seminar has been well-received by non-technical executives wanting to understand office automation.



A 3-DAY SEMINAR NOVEMBER 9-11, 1981

Registration: 8:00-9:00 a.m.
Seminar: 9:00 a.m.-5:00 p.m.

Sheraton Inn Washington NW
8727 Colesville Road
Silver Spring, MD 20919
(301) 589-5200

SEMINAR FEE: \$695.00

THE PLUG-IN-THE-WALL

Networks are about to invade your office. Are you aware of your options? Your opportunities? Have you noticed how many terminals and microprocessors are appearing on your colleagues' desks? We now have reached the stage where low-cost, high-speed, low-delay data pipes are required to interconnect these devices with each other and with your system's shared mainframes and peripherals. Fortunately, the technology to accomplish this is here — now we can discuss information outlets (wall plugs for data) in a meaningful way.

Technology Transfer has arranged for three of the industry's leaders to present to you the latest in local data network technology. Let them tell you about the Ethernet — the local bus on a coaxial cable that has captured the attention and imagination of the world of local data communications. Learn about the pros and cons of, and alternatives to, Ethernet. Hear about the latest developments from the individuals who are creating the technology.

JOHN F. SHOCH

has worked extensively on the development of local computer networks (the Ethernet system), internetwork protocols (the PUP internet architecture), packet radio, and other aspects of distributed systems. He is currently Assistant to the President of Xerox Corporation. Dr. Shoch has lectured and published widely on the subject of computer communications, and is author of the forthcoming book, *Local Computer Networks*, to be published by McGraw-Hill. He has taught at Stanford University, and serves as vice chairman (U.S.) of the IFIP Working Group 6.4 on local computer networks. He received his M.S. and Ph.D. degrees in Computer Science from Stanford University.

DONALD F. WEIR

has had extensive experience in the specification and implementation of packet-switched protocols. He is currently Director of Research and Planning for GTE Telenet, where he is responsible for planning, system design, and development of advanced products. His previous experience has included protocol development, network architecture design, and customer troubleshooting. Mr. Weir also teaches a Technology Transfer course on X.25 and Other Protocol Interfaces. He holds a Bachelor's degree in mathematics from the Univ. of Waterloo, and a Master's degree in electrical engineering from Carleton Univ. in Ottawa.

LAWRENCE G. ROBERTS

is the gentleman who formulated the design and principles of operation and directed the development for the first operational packet-switching network (the ARPANET). After receiving his Ph.D. from MIT, he went on to head a computer research program at Lincoln Laboratory. Dr. Roberts then joined ARPA and directed the ARPANET development. In 1973 he became President of what is now GTE Telenet Communications Corporation, where he guided the organizational and technical development of the first packet-switching network in the U.S. to offer public service as an FCC-approved communications common carrier. Dr. Roberts is the author of a number of key papers, was awarded the Meritorious Civilian Service medal by the Secretary of Defense in 1973, and was the recipient of the AFIPS Harry Goode Memorial Award in 1976.

SYLLABUS

INTRODUCTION

DESIGN CRITERIA
DIMENSIONS OF THE DESIGN SPACE
A TAXONOMY OF LOCAL NETWORK DESIGNS
COMPARISON OF ALTERNATIVE ARCHITECTURES

THE ETHERNET

DETAILED DESCRIPTION
MEASURED PERFORMANCE
DERIVATIVES AND OTHER "ETHERNET-STYLE" SYSTEMS
THE 10 MBPS XEROX/DEC/INTEL SPECIFICATIONS

INTERNETWORKING
CARRYING VOICE TRAFFIC

USER REQUIREMENTS

VOICE MODEL
DATA MODEL INCLUDING FACSIMILE AND WORKSTATIONS
OVERALL TRAFFIC STATISTICS
PHYSICAL LAYOUT

PBX

CURRENT ENVIRONMENT
DISTRIBUTED PBX

TRENDS IN THE DIGITAL APPROACH

LOCAL AREA NETWORK ALTERNATIVES

MEDIA ACCESS — INCLUDING TOKEN-BASED SCHEMES
PERFORMANCE OF MEDIA ACCESS SCHEMES

TRANSMISSION MEDIUM — FIBER OPTICS AND BROADBAND
PROTOCOLS — IEEE PROPOSAL AND RELATIONSHIP TO THE ISO OPEN SYSTEMS INTERCONNECTION MODEL

EXTERNAL INTERCONNECTION TO LONG-HAUL NETWORKS

SYSTEM PERFORMANCE

DISTRIBUTED VS. REMOTE
TOTAL TRAFFIC — INCLUDING VOICE AND FAX
TYPICAL EXAMPLES OF OFFICES

ECONOMICS OF THE VARIOUS APPROACHES

EQUIPMENT COSTS
SYSTEM CAPACITY ECONOMICS
EXTERNAL VARIABLES, e.g., VOICE DELAY

PURPOSE

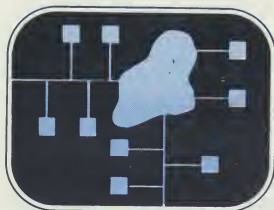
This seminar was created to bring you up to date on the fast-moving technology of local data networks and to point out the likely impact and directions for today's corporate data communication needs.

The seminar begins by identifying the need and choices for current local data networks. Various architectures are considered, with a heavy focus on Ethernet and its derivatives — what is Ethernet, how does it work, why is it so popular, how efficient is it, will it handle voice as well as data, how about video and fax? The IEEE is considering a second scheme based on token-passing. Why two? How do they compare? The traditional solution of a private branch exchange (PBX) is also considered in this presentation; this is especially important in view of the radical new offerings we now see in the marketplace. Other transmission media such as broadband and fiber optics are also addressed. The larger issues of system performance and economic considerations complete the seminar presentation.

AUDIENCE

This seminar is intended for technical managers, data communication planners, information resource managers, and all those concerned with wiring the wired office. It is much more than simply a management overview — it is intended for an audience of serious individuals interested in understanding and updating themselves on the latest technologies and offerings in the arena of local data networks. For those interested in the design of distributed systems based on local networks, please see page 8 of this brochure.

4. INTEGRATED DISTRIBUTED SYSTEMS



**A 3-DAY SEMINAR
NOVEMBER 9-11, 1981**

**Registration: 8:00-9:00 a.m.
Seminar: 9:00 a.m.-5:00 p.m.**

**Hilton Sunnyvale
1250 Lakeside Drive
Sunnyvale, CA 94086
(408) 738-4888**

SEMINAR FEE: \$695.00

Technology Transfer has gathered together two of the foremost designers of integrated systems to give you the foundation to make any distributed system you build work properly and efficiently. Gerald Popek and Charles Kline both have extensive experience in the field of distributed system design and implementation.

GERALD J. POPEK

is a leading figure in the area of distributed systems, is Professor of Computer Science at UCLA, and a partner in PALYN Associates, a high technology consulting firm based in San Jose. He has consulted widely for such clients as Honeywell, IBM, Xerox, Olivetti, and others. Most recently, he has been deeply involved in the design of distributed system architectures for Olivetti and Honeywell. At UCLA, he has led an ARPA-supported research effort that performed extensive work in computer security, and more recently designed and developed the high performance local network based distributed system, LOCUS. Dr. Popek has lectured widely throughout the U.S., Europe, and South America. He received his Ph.D. from Harvard University in Computer Science.

CHARLES S. KLINE

has designed and implemented numerous operating systems and networks, and is currently a Computer Systems Designer at UCLA working with Dr. Popek. He has consulted widely for industry, and was one of the developers of the ARPANET. His more recent activities include extensive work on computer security both in operating systems and networks, and the design of the distributed system LOCUS. His Ph.D. is in Computer Science from UCLA.

AUDIENCE

This seminar is intended for users, system architects/designers, and technical managers involved in distributed systems, especially those based on local network technology. The course is also recommended for those intending to develop or purchase local network hardware/software. For those interested in a detailed presentation of the communication issues in local networks, please see the Local Data Networks seminar on page 6 of this brochure.

INTERCONNECT

Distributed systems are to be found everywhere, largely due to the availability of high-speed/low-delay/low-cost local networks. This development now allows extensive interconnection of computing equipment in a variety of forms. It has become feasible to utilize many small systems rather than a few large ones to provide enhanced capabilities. However, this opportunity also presents challenges to make effective use of these facilities.

Unlike other networks, local area networking leads one toward network nodes acting together as an integrated distributed system rather than as separate machines attached to communications lines. Many application areas such as office automation or high reliability/availability system needs are strongly supported by that organization because of the significant interaction among workstations and other services in the planned network environment. Issues which must be dealt with in that context include the choice of the local network hardware technology, communication protocols for system interaction, reliability, and availability.

POPEK ■ KLINE

SYLLABUS

INTRODUCTION TO LOCAL NETWORK DISTRIBUTED SYSTEMS

MOTIVATIONS FOR DISTRIBUTED SYSTEMS

COMMUNICATIONS, RELIABILITY, AVAILABILITY, ENHANCED FACILITIES,
COST/BENEFIT ADVANTAGES, AUTONOMY

RELATIONSHIP BETWEEN LOCAL NETWORKS AND GEOGRAPHICAL NETWORKS

PHYSICAL NETWORK DESIGN ISSUES

ETHERNET AND OTHER CONTENTION TECHNIQUES

RINGS: TOKEN AND OTHERS

AVAILABLE PRODUCTS

SYSTEM ARCHITECTURE ISSUES

NETWORK TRANSPARENCY

NAMING, LOCATING, AND BINDING

DISTRIBUTED APPLICATIONS MECHANISMS

MESSAGES

PROCEDURE CALLS

MONITORS

ATOMIC AND RELIABLE OPERATIONS

MULTIPLE COPY SUPPORT

DISTRIBUTED DATA BASE MANAGEMENT

INTER-NETWORKS

PROTOCOLS

CASE STUDIES

INTEL

DEC

XEROX

ZILOG

RESEARCH ACTIVITIES

PURPOSE

This course will provide a detailed look at the potential of distributed systems. With careful design, it is possible to build a distributed system for the 1980s which solves rather than creates problems. As an example, many distributed systems have the potential for reliability via the inherent redundancy of those systems, but few are able to take advantage of this potential. As another example, constructing distributed applications is often an extremely difficult problem as the application must deal with the parallelism and complex failure modes present. In this course, these and other issues are examined in detail and solutions presented.

The course discusses the impact of local network technology on distributed system architecture and examines the opportunities which become available with that technology. It is possible to build a high performance, exceedingly reliable distributed system base which also simplifies the construction of application software. The course reviews the many issues involved in the design of such a distributed system, and presents case studies of successes and failures in the area. Also detailed are the various technologies for implementing local networks (Ethernet, Rings, others), the tradeoffs involved, and vendor products now available.



**A 3-DAY SEMINAR
NOV. 30-DEC. 2, 1981**

**Registration: 8:00-9:00 a.m.
Seminar: 9:00 a.m.-5:00 p.m.**

**Key Bridge Marriott
1401 Lee Highway
Arlington, VA 22209
(703) 524-6400**

SEMINAR FEE: \$695.00

GROUND RULES FOR MEANINGFUL COMMUNICATIONS

Communications architecture often seems incredibly complex due to the many options and requirements that must be considered. Surprisingly, this architecture can be separated into conceptually *simple* and *logical* functions. The IBM Systems Network Architecture (SNA) is a comprehensive and rapidly evolving example of a communications architecture which addresses not only the bit transportation functions, but also the dialogue disciplines that enable meaningful communication among diverse units.

During the 70's, in an orderly progression, SNA was developed as an architectural basis upon which the computer-communication networks of the 80's are being built. The first comprehensive textbook on SNA was recently published, and will be used as a basis for this seminar. Included in this book are explanations of the fundamental reasoning behind the SNA development, its layers, single- and multi-host systems, multi-domain mesh networks, alternate paths, priority, and the use of class service.

Both Mr. Markov and Dr. Piatkowski played instrumental roles in the development of IBM's SNA with contributions spanning the range of overall functional content all the way to specific architectural statements in terms of finite state machines. You will realize, after taking this seminar, that an orderly walk through an architecture can create a logical foundation for distributed data processing systems. Indeed, an in-depth understanding of the formats and protocols to be presented is essential for any organization involved in configuring a system which employs SNA.

JAMES D. MARKOV

is a leader in the field of computer communications systems and networks. He is a Senior Engineering Manager with IBM Systems Communications Division, has held several management positions, and is currently manager of local network projects. In the early 1970's, he conducted fundamental investigations on the reliability and performance of computer networks, which resulted in a mathematical model of the reliability of transmission lines. This led to a revolutionary change in the development of distributed communications systems. Fundamentals of this work have been published in a paper entitled *A Reliability Model for Data Communications*. Mr. Markov's work has centered around SNA/SDLC, and he led the development of the SNA multi-systems networking architecture. He holds a Masters of Science degree from the University of Alabama and has written several technical papers and invention disclosures. He is an international lecturer, has taught courses at IBM's SRI, as well as many special courses for computer professionals.

THOMAS F. PIATKOWSKI

is an authority in formal techniques for the design specification, analysis, and testing of computer networks and distributed processing systems. He worked with IBM's Systems Communication Division where he was involved in the design of SNA and led the technical effort that produced the formal specification of SNA in IBM's SNA Format and Protocol Reference Manual. He received his Ph.D. in E.E. from the University of Michigan, and is currently Associate Professor of Electrical and Computer Engineering at Iowa State University.

SYLLABUS

**NETWORK ADDRESSABLE UNITS
SESSIONS
FUNCTIONAL LAYERS
CONTROL DOMAINS
NETWORK SERVICES
PRESENTATION SERVICES
DATA FLOW CONTROL: CHAINS, RESPONSES, BRACKETS
TRANSMISSION CONTROL: PACING
PATH CONTROL: ROUTING, ADDRESSING, SEGMENTING, VIRTUAL ROUTES, AND EXPLICIT ROUTES
PARALLEL LINKS
CLASS OF SERVICE
DATA LINK CONTROL: SDLC AND HDLC
LU TYPES
HIGHER LEVEL PROTOCOLS
MULTI-DOMAIN NETWORKS
CONFIGURATIONS
THE X.21 AND X.25 INTERFACES
PROBLEM DETERMINATION**

PURPOSE

An understanding of communications architecture can turn your present confusion into comprehension that can be directly and immediately applied. This seminar will explain the concepts and facilities of the Systems Network Architecture for networks involving centralized data processing, multiple (peer) data processing centers, and distribution of function to subordinate nodes. It is primarily intended to provide an understanding of concepts and rationale, but it also provides a thorough review of the SNA formats and protocols.

You will study the higher level services that match end users to one another and establish logical connections. You will review the disciplines that regulate the flows between end users, the means for reaching agreement on the facilities for a particular session, and message transportation in diverse configurations. Jim Markov and Tom Piatkowski will show you how these all fit in a multiple-host, multiple-control domain environment. The important and timely relation of SNA to the X.21 and X.25 interfaces will also be explained.

AUDIENCE

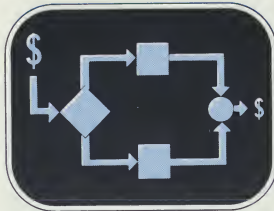
This seminar is intended for those computer professionals involved with designing, installing, managing, analyzing, or using a data processing network.

TEXTBOOK

Rudolph Cypser, *Communications Architecture for Distributed Systems*, Addison-Wesley Publication Company, 1978.



6. SOFTWARE ENGINEERING ECONOMICS



A 3-DAY SEMINAR DECEMBER 7-9, 1981

Registration: 8:00-9:00 a.m.
Seminar: 9:00 a.m.-5:00 p.m.

Sheraton Fisherman's Wharf
2500 Mason Street
San Francisco, CA 94133
(415) 362-5500

SEMINAR FEE: \$695.00

SABOTAGED BY SOFTWARE?

Are your software costs running amuck? What factors are influencing this uncontrolled expenditure? Can you *realistically* understand and apply software project planning and control techniques? What are the latest such tools? Do you know how to apply cost-effectiveness analysis techniques to software engineering decision situations? How can you apply high-leverage techniques to improve productivity?

All important questions! But, are the answers you get giving you the results you need or the answers your DP department wants you to hear? Technology Transfer now gives you the opportunity to get the answers you'd like to hear *AND* get the results you need in one brand new, information-packed, three-day seminar by Barry Boehm, one of the world's most knowledgeable software innovators and experts. Dr. Boehm will lead you through the maze of software economics, and detail the latest formulas and methods to keep your software costs from giving you the coup d'etat.

BARRY BOEHM

is Director of Software Research and Technology, Software Systems Operations; Defense and Space System Group, TRW, Inc. He is currently Manager of TRW's Software Productivity Program, a major effort to develop an integrated corporate software engineering environment, including facilities, local networks, automated aids, and associated procedures. His responsibilities also include direction of TRW's internal software research and development program, of TRW contract software technology projects, of the TRW software development policy and standards program, and of the TRW Software Cost Methodology Program. He was previously Head of the Information Sciences Department at the Rand Corporation, and Director of the U.S. Air Force Command, Control Information Processing Study (CCIP-85).

Dr. Boehm received his B.A. in Mathematics from Harvard and his M.A. and Ph.D. from the University of California, Los Angeles (UCLA). He also currently holds the position of Visiting Professor of Computer Science at UCLA, and is Chairman of the IEEE Technical Committee on Software Engineering. Dr. Boehm is the author of *Software Engineering Economics*, the seminar text.

AUDIENCE

This course should be of primary interest to computer and software managers, analysts, and programmers concerned with the cost-effectiveness of their software products and projects.

BOEHM

SYLLABUS

INTRODUCTION

THE SOFTWARE LIFE CYCLE
THE "WATERFALL" MODEL
ECONOMIC RATIONALE
REFINEMENTS: PROTOTYPING,
INCREMENTAL DEVELOPMENT

SOFTWARE COST ESTIMATION SEVEN BASIC STEPS ALTERNATIVE ESTIMATION TECHNIQUES

BASIC COCOMO (CONSTRUCTIVE COST MODEL)

SOME SIMPLE COST AND
SCHEDULE EQUATIONS
HOW TO ESTIMATE PHASE AND
ACTIVITY DISTRIBUTIONS
HOW TO ESTIMATE SOFTWARE
MAINTENANCE COSTS

INTERMEDIATE COCOMO

GENERATING MORE ACCURATE
ESTIMATES

COST DRIVER ATTRIBUTES AND
EFFORT MULTIPLIERS

EXAMPLES OF MODEL USES

CONVERSION COSTS

IMMEDIATE AND DETAILED COCOMO

MACRO- AND MICRO-LEVEL
REFINED ESTIMATION

COCOMO VALIDATION AND USAGE VALIDATION RESULTS

COMPARISON OF COCOMO TO OTHER MODELS TAILORING COCOMO

SOFTWARE LIFE-CYCLE COST ESTIMATION

COST ESTIMATION EXAMPLE

SOFTWARE PROJECT PLANNING AND CONTROL (P&C)

KEY P&C TECHNIQUES

PROJECT EXAMPLE

COST ESTIMATION INPUTS

PLANNING INSTRUMENTS

CONTROL INSTRUMENTS

SOFTWARE COST-EFFECTIVENESS ANALYSIS

ECONOMIES OF SCALE

DECISION CRITERIA

FIGURES OF MERIT

EXAMPLES

IMPROVING SOFTWARE PRODUCTIVITY

MEASURING SOFTWARE PRODUCTIVITY

COST MODEL INSIGHTS

WRITING LESS CODE

SOFTWARE PRODUCTIVITY CONTROLLABLES

A PRODUCTIVITY IMPROVEMENT PROGRAM

CONCLUSIONS AND RECOMMENDATIONS

PURPOSE

The content of this seminar is based primarily on Dr. Boehm's new book *Software Engineering Economics*, published by Prentice-Hall in 1981.

The centerpiece of the seminar is a powerful new model for software cost estimation, the COConstructive COSt Model (COCOMO). This model provides a consistent hierarchy of increasingly detailed and accurate formulas and tables for estimating software development, maintenance, adaptation, conversion, computing, and other associated costs, along with cost breakdowns by software life-cycle phase and activity.

The seminar will present the COCOMO hierarchy of models, with examples of their use. It will also present a number of related topics: alternative techniques for cost estimation, software project planning and control techniques, software cost-effectiveness analysis, and techniques for improving software productivity.

TEXTBOOK

Barry Boehm, *Software Engineering Economics*, Prentice-Hall, 1981.

Seminar Information

SEMINAR FEE OF \$695.00 INCLUDES:

- Textbooks/course notes
- Refreshment breaks
- Luncheon each day
- Certificate of completion

REGISTRATION INFORMATION: To reserve places at any of the seminars, mail the completed SEMINAR REGISTRATION FORM to TTI.

TTI accepts no liability for any consequences arising from opinions, views, or advice expressed by its lecturers. Topics may be moved from one session to another depending on time constraints. Cancellations received by TTI less than three weeks before the seminar are subject to a \$35.00 service charge. Registrants who fail to attend and do not contact TTI within three working days prior to the meeting are liable for the entire fee. Cancellation Liability: In the event of cancellation of any seminar for any reason, TTI's liability is limited to the return of the registration fee.

FALL SEMINAR GIVE AWAY: For each five paid registrants from the same company who attend the same seminar, a sixth may attend tuition-free.

CONTINUING EDUCATION UNITS (CEU): The CEU is a standard measurement for noncredit continuing education programs. One CEU is given for each ten contact hours of participation in a course.

DAILY SCHEDULE:

8:00-9:00	9:00-10:30	11:00-12:30	1:30-3:00	3:30-5:00
Registration and coffee (1st day only)	Lecture	Lecture	Lecture	Lecture

IN-HOUSE SEMINARS: In-house seminars are available. For information, contact TTI.

HOTEL INFORMATION: Participants must reserve their own hotel accommodations. Blocks of rooms have been reserved at all hotels; they will be held for TTI attendees for up to four weeks prior to the start of the seminar. In order to obtain the quoted rates listed below, you MUST call:

CMA CORPORATION (800) 556-6882

(The toll-free line is available Monday through Thursday from 9:00 a.m. until 8:00 p.m., and on Friday until 6:00 p.m., Eastern Time. Travel arrangements may also be made through CMAC.)

You must mention TTI to receive the special rates listed below. TTI accepts no responsibility for hotel costs, reservations, or availability. MAKE YOUR RESERVATIONS EARLY. The seminars will be held in the following hotels (addresses are listed with the seminar description):

Capacity Planning
Springfield Hilton Hotel
\$51.00 Single, \$68.00 Twin

Office Information Systems

Twin Bridges Marriott
\$79.00 Single, \$89.00 Twin
Sheraton Fisherman's Wharf
\$83.00 Single, \$93.00 Twin

Local Data Networks

Sheraton Inn Washington NW
\$50.00 Single, \$56.00 Twin

Integrated Distributed Systems
Hilton Sunnyvale
\$66.00 Single, \$78.00 Twin

SNA

Key Bridge Marriott
\$88.00 Single, \$100.00 Twin

Software Engineering Economics

Sheraton Fisherman's Wharf
\$83.00 Single, \$93.00 Twin

For additional information please call:
(213) 394-8305
or write to:

**TECHNOLOGY
TRANSFER
INSTITUTE**
741 10th ST. SANTA MONICA, CA 90402, (213) 394-8305

Seminar Registration Form

(or use the enclosed Master Seminar Registration Card)

Enclosed is check for \$_____ (U.S.) or company purchase order to cover _____ enrollments as shown below:

Participants:	Check Course No. Boxes:						
Name _____	1 <input type="checkbox"/>	2a <input type="checkbox"/>	2b <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
Title _____							
Name _____	1 <input type="checkbox"/>	2a <input type="checkbox"/>	2b <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
Title _____							
Name _____	1 <input type="checkbox"/>	2a <input type="checkbox"/>	2b <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
Title _____							
Name _____	1 <input type="checkbox"/>	2a <input type="checkbox"/>	2b <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
Title _____							

Organization _____

Address _____

City _____ State _____ Zip _____

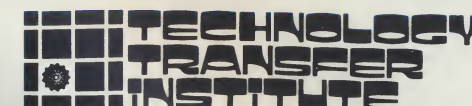
Company Telephone () _____

Reservation Made By: _____

Authorizing Signature: _____ Date _____

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|--|----------------------|
| 1. Capacity Planning | Oct. 26-28, 1981 |
| 2a. Office Information Systems | Oct. 26-28, 1981 |
| 2b. Office Information Systems | Nov. 30-Dec. 2, 1981 |
| 3. Local Data Networks | Nov. 9-11, 1981 |
| 4. Integrated Distributed Systems | Nov. 9-11, 1981 |
| 5. SNA | Nov. 30-Dec. 2, 1981 |
| 6. Software Engineering Economics | Dec. 7-9, 1981 |

Make checks
payable to:



741 10th ST. SANTA MONICA, CA 90402, (213) 394-8305

CODE: 0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N

FALL 1981 SCHEDULE

Technology Transfer Institute offers 15 Seminars of Excellence plus the James Martin Seminars. They are presented by over 20 of the leading world authorities in the fields of **Computer/Communications and Data Processing Systems.**

JAMES MARTIN WORLD SEMINAR

FIVE-DAY SEMINAR

October 12-16, 1981
October 19-23, 1981
November 2-6, 1981
November 16-20, 1981

Atlanta
Toronto
Boston
San Francisco

SENIOR MANAGEMENT DAY

October 12, 1981
October 19, 1981
November 2, 1981
November 16, 1981

SEMINARS OF EXCELLENCE

DP TECHNOLOGY

Performance Evaluation

DENNING

October 12-14, Palo Alto

Reliable Computing Through Fault-Tolerance

AVIZIENIS

October 26-28, San Francisco

Queueing Systems

KLEINROCK

November 3-5, Boston

Database System Technology

BERNSTEIN

November 4-6, San Francisco

Digital Image Processing and Analysis

PRATT

November 16-18, Washington, D.C.

Computer Networks

KLEINROCK

November 17-19, San Francisco

DP APPLICATIONS

Capacity Planning

BUZEN, DENNING, SCHWETMAN

October 26-28, Washington, D.C.

Office Information Systems

CARLISLE, WATTEUW

October 26-28, Washington, D.C.

November 30-December 2, San Francisco

Local Data Networks

SHOCH, WEIR, ROBERTS

November 9-11, Washington, D.C.

Integrated Distributed Systems

POPEK, KLINE

November 9-11, Sunnyvale

SNA

MARKOV, PIATKOWSKI

November 30-December 2,

Washington, D.C.

Software Engineering Economics

BOEHM

December 7-9, San Francisco

DP SPECIALTIES

Data Base — The Second Wave

HOLLAND

November 9-11, Chicago

December 7-9, Boston

X.25 and Other Protocol Interfaces to Packet Switched Networks

KARP, WEIR

October 12-14, Boston

November 30-December 2, Sunnyvale

IBM and Your DP Strategy

LAMOND

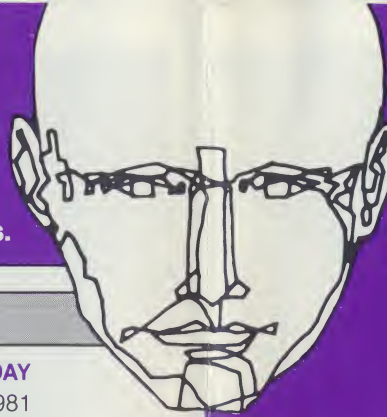
November 30-December 3, Chicago

December 7-10, New York

FOR DETAILS CONTACT:



741 10th ST. SANTA MONICA, CA 90402, (213) 394-8305



IBM

AND YOUR DP STRATEGY

A FOUR-DAY SEMINAR BY **FREDERIC LAMOND**

NOV. 30-DEC. 3, 1981 — CHICAGO

DEC. 7-10, 1981 — NEW YORK

DIVIDED INTO TWO MINI-SEMINARS

DAY 1 — The Executive Summary

CORPORATE STRATEGIES: NEW OPPORTUNITIES

NOV. 30, 1981 — CHICAGO • DEC. 7, 1981 — NEW YORK

DAYS 2-4 — The Detailed Considerations

DP STRATEGIES: NEW CHALLENGES

DEC. 1-3, 1981 — CHICAGO • DEC. 8-10, 1981 — NEW YORK



741 10th ST. SANTA MONICA, CA 90402, (213) 394-8305

IS THERE A BETTER WAY?

Should DP and information system design remain **centralized** in the professional DP department, or can it now be **spread** among the end user departments? Should end users have their own computer systems? Is your DP department keeping up with end user requests for new applications? Should you keep voice and data networks separate? Have you taken changing cost relationships between hardware, software, and manpower into account in designing your needs for the 1980's? Are you fully familiar with the broadening range of options that IBM and other vendors offer you?

Do professional staff in your end user departments perceive your computer systems as *enriching* their work by relieving them of dull routine, or, on the contrary, as *de-skilling* them to the role of data gatherers?

Has it become hard to keep experienced DP professionals on your staff? Is your DP department using these scarce and expensive personnel resources in a cost-effective manner?

OPTIMIZING HARDWARE OR PEOPLE?

Why is the cost of your DP operation increasing year by year, outrunning the mad pace of inflation? You must have read that computer hardware prices have dropped to 1% of their 1965 levels (and continue to decrease), so what's the answer?

Most likely, the vast majority of the bottlenecks, cost overruns and end user complaints that plague many of today's computer systems arise from outdated system design and programming methods that still seek to optimize computer hardware usage. Now, how to get around the problem?

In this unique seminar, intended for senior managers and DP professionals, Frederic Lamond will describe the remedies most likely to succeed in today's environment of cheap computer hardware. The answer lies in using computer power generously to **optimize the time and skills of personnel**.

STRUCTURE OF THE SEMINARS

Fred Lamond has organized a comprehensive four-day seminar that will give you the insight to deal with the economic, hardware, software, and peopleware problems of the 1980's. This seminar may be divided into two mini-seminars:

DAY 1 — CORPORATE STRATEGIES: NEW OPPORTUNITIES

As part of the four-day seminar, he has organized the first day as a self-contained, one-day seminar — **an executive summary** — to give an overview of the DP choices available in the 1980's in *business terminology*.

DAYS 2-4 — DP STRATEGIES: NEW CHALLENGES

This self-contained three-day seminar is structured for more technically oriented managers and system designers who desire a working knowledge of design and strategic considerations on a more advanced level. Special emphasis will be placed on software development tools, replacement and additional processors, programmable terminals, and satellite systems offered by IBM and other vendors to users of all sizes.

DAYS 1-4 — IBM AND YOUR DP STRATEGY

Or you can attend all four days, and grasp the business and strategic issues involved along with the technical details necessary to implement any strategic plan.

AUDIENCE

Anyone concerned with the planning, implementation, and funding of corporate information systems.

DAY 1 — CORPORATE STRATEGIES: NEW OPPORTUNITIES

CORPORATE DIRECTORS OF INFORMATION SYSTEMS AND NETWORKS

Are the answers to your planning questions determined by the technology available, or do you now have a choice of tools and methods to implement any system that matches your corporate management philosophy?

DP MANAGERS AND SYSTEMS DESIGNERS

Are you sure that you are using the most cost-effective system design and programming tools that are now at your disposal? Should you continue to match growing work loads by exchanging your processor periodically for a more powerful one? Or is it more economical to add a second or third processor to the first? Should they be located at the central DP site, or could they be dispersed among the end users? Should additional processors always be compatible with those you have already installed? Should they always come from the same vendor?

COMMUNICATIONS MANAGERS

Does the digitization of voice allow voice and data networks to be integrated? Do you need a separate architecture for your local networks from your long distance ones, or will a single one do? If so, should it be circuit or packet switching? SNA or X.25?

EQUIPMENT MANUFACTURERS

What do competing manufacturers have up their sleeves for the 1980's, and how can you take advantage of this information?

CONSULTING, ACCOUNTING, AND FINANCIAL FIRMS

Be prepared to advise your clients about *all* the options available to them.

FREDERIC LAMOND

worked for five years in market research at The Economist Intelligence Unit before joining Univac in 1960 as a Senior Systems Analyst. Since then, he has been employed as Export Sales Consultant and Technical Support Manager for English Electric Computers, Technical Consultant at Leasco Systems and Research, and European Editor of the *Auerbach Computer Technology Reports*.

Since 1975, he has combined his regular contributions to the international computing press (*Datamation* and *Computer Weekly*) with a growing consultancy activity. He has just completed an intensive, in-depth study of the IBM 4300 Series for a major client. He has specialized for many years in the analysis and evaluation of IBM products.

Mr. Lamond is a graduate in economics from the University of Chicago and Cambridge. He is an excellent and lucid speaker, whose mastery of the subject is unquestioned.

DAY 1

CORPORATE STRATEGIES: NEW OPPORTUNITIES

MINIMIZING COSTS IN A CHANGING ENVIRONMENT

The hardware/manpower tradeoff. Why traditional system design methods optimized expensive computer hardware. How falling computer hardware costs have made them obsolete. Minimizing overall information system costs in the 1980's by optimizing people's skills.

PRINCIPLES OF USER-FRIENDLY SYSTEM DESIGN

Why many computer systems are perceived as deskilling professionals and middle-management. Over-ambitious attempts at complete automation. A better alternative: computer-aided (rather than computerized) management systems? Who should design them — computer professionals or end users? Lessons for the dawning era of office automation.

CENTRALIZED OR DISTRIBUTED PROCESSING NETWORK

The computer hardware/communications line costs trade-off. A broadening range of systems choices: network structures to match all corporate management philosophies and organization schemes.

SINGLE OR MULTIPLE VENDORS FOR CORPORATE INFORMATION SYSTEMS

Advantages and disadvantages of each approach. Single vendor approach increasingly difficult to maintain within converging computer/communications/office automation environment.

DAYS 2-4

DP STRATEGIES: NEW CHALLENGES

DAY 2: From Batch to Interactive Programming and Processing

GOOD-BYE TO ALL BATCH

Centralized batch processing: a technique for optimizing expensive computer hardware usage in the 1960's. Why falling computer hardware costs have made this obsolete. Alternative cost-effective methods: interactive programming and processing, database management systems.

EVOLVING BATCH INTO INTERACTIVE OPERATING SYSTEMS: IBM DPD'S APPROACH

From OS/360/MVT to MVS/SP. From VM/370 to VM/SP. From DOS and DOS/VS to DOS/VSE. Why OS/VS1 is to be stabilized. Advantages and disadvantages of the evolutionary approach: growing modularity and complexity of operating systems. Do SIPO/E's mitigate this?

IBM GSD'S GREEN FIELD APPROACH: SYSTEM 38

System/38: an integrated hardware/firmware/systems software design for interactive database design and updating. Simplicity of the integrated operating system. For new users only, or can larger, established users also benefit?

ALTERNATIVES TO THE IBM SYSTEM SOFTWARE

Is continued batch processing viable? Alternative vendors' systems software for IBM systems. Other computer system manufacturers' system software: a happy mean?

DAY 3: From Single to Multiple Processors per User

ALL DATA ON-LINE AND ITS IMPLICATIONS

IBM's latest disc drives: why are they all fixed? Technical and systems reasons. New, more complex procedures for security dumping and recovery. Trend to file and processor duplication. Other vendors' more conservative approach.

THE INVERSION OF GROSCH'S LAW AND ITS CONSEQUENCES

A comparison of the specifications, prices, and resulting cost-effectiveness of IBM's 4300 and 30XX processors. Alternative growth paths of small, medium, and large System/370 users. When are multiple 4300's more cost-effective than a single 30XX?

THE FUTURE OF THE LARGE COMMERCIAL MAINFRAME

Do large IBM 30XX-type general-purpose processors have a long-term future in commercial DP environments? Some possible applications. The IBM strategy: centralized corporate databases within distributed processing networks. Some possible alternatives.

ALTERNATIVE 370-COMPATIBLE PROCESSORS

Used IBM 370's and other manufacturers' 370-compatible processors. Their respective advantages and disadvantages.

DAY 4: From Centralized to Distributed Processing Networks

FROM DISTRIBUTED ACCESS TO DISTRIBUTED INTELLIGENCE

Definitions. Why IBM used to oppose "distributed intelligence," but was forced to change its approach. SNA's changing structure.

ALTERNATIVE COMMUNICATIONS NETWORK ARCHITECTURES

Circuit switching versus packet switching network structures in local and long distance networks: when is each suitable? All-data versus mixed voice/data networks. SNA versus X.25. Interfacing IBM and other vendors' host computers to X.25 networks.

USER FRIENDLY SATELLITE SYSTEMS FOR END USER DEPARTMENTS

Contrasting approaches of IBM's Data Processing and General Systems Divisions. DPD's host-department 4331 DOS/VSE and 8100 DPPX systems. GSD's self-sufficient Systems/38 and 34, Series/1, 5280. Can BSC work with satellites?

OTHER MANUFACTURERS' SATELLITE SYSTEMS

Other manufacturers' minicomputers and distributed processing systems with IBM host-compatible SDLC, 3270 BSC and/or HASP RJE communications protocols. How they compare with IBM satellites.



SEMINAR INFORMATION

REGISTRATION INFORMATION: To reserve places at one of the seminars, mail the completed SEMINAR REGISTRATION FORM to TTI. In the event of cancellation of the seminar for any reason, TTI's liability is limited to the return of the registration fee.

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Chicago Hyatt
151 E. Wacker Drive
Chicago, Illinois 60601
(312) 565-1000

\$89.00 Single, \$100.00 Twin

Halloran House
525 Lexington Avenue
New York, New York 10017
(212) 755-4000

\$85.00 Single, \$95.00 Twin

For additional information please call **(213) 394-8305** or write to
Technology Transfer Institute 741 10th St., Santa Monica, CA 90402

SEMINAR REGISTRATION FORM

(or use the enclosed Master Seminar Registration Card)

Enclosed is a check for \$_____ (U.S.) made payable to Technology Transfer Institute, or a purchase order, to cover _____ enrollments as shown below:

ALL FOUR DAYS — IBM AND YOUR DP STRATEGY

FEE: \$895.00 (U.S.) for either four-day seminar. Fee includes:

- Course notes
- Four luncheons
- Refreshment breaks
- Certificate of Completion

DAILY SCHEDULE: 8:00–9:00 a.m. Registration (first day only);
9:00 a.m.–5:00 p.m. Lecture; 12:30–1:30 p.m. Luncheon.

CHICAGO NOV. 30–DEC. 3, 1981 **NEW YORK DEC. 7–10, 1981**

Name _____	Name _____
Title _____	Title _____
Name _____	Name _____
Title _____	Title _____

DAY 1 — CORPORATE STRATEGIES: NEW OPPORTUNITIES

FEE: \$295.00 (U.S.) for either one-day seminar. Fee includes:

- Course notes
- Luncheon
- Refreshment breaks
- Certificate of Completion

SCHEDULE: 8:00–9:00 a.m. Registration; 9:00 a.m.–5:00 p.m.
Lecture; 12:30–1:30 p.m. Luncheon.

CHICAGO NOV. 30, 1981 **NEW YORK DEC. 7, 1981**

Name _____	Name _____
Title _____	Title _____
Name _____	Name _____
Title _____	Title _____

DAYS 2–4 — DP STRATEGIES: NEW CHALLENGES

FEE: \$695.00 (U.S.) for either three-day seminar. Fee includes:

- Course notes
- Three luncheons
- Refreshment breaks
- Certificate of Completion

DAILY SCHEDULE: 8:00–9:00 a.m. Registration (Tuesday);
9:00 a.m.–5:00 p.m. Lecture; 12:30–1:30 p.m. Luncheon.

CHICAGO DEC. 1–3, 1981 **NEW YORK DEC. 8–10, 1981**

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FALL 1981 SCHEDULE

Technology Transfer Institute offers 15 Seminars of Excellence plus the James Martin Seminars. They are presented by over 20 of the leading world authorities in the fields of
Computer/Communications and Data Processing Systems.

JAMES MARTIN WORLD SEMINAR

FIVE-DAY SEMINAR

October 12-16, 1981
October 19-23, 1981
November 2-6, 1981
November 16-20, 1981

Atlanta
Toronto
Boston
San Francisco

SENIOR MANAGEMENT DAY

October 12, 1981
October 19, 1981
November 2, 1981
November 16, 1981

SEMINARS OF EXCELLENCE

DP TECHNOLOGY

Performance Evaluation
DENNING

October 12-14, Palo Alto

Reliable Computing Through
Fault-Tolerance

AVIZIENIS

October 26-28, San Francisco

Queueing Systems
KLEINROCK

November 3-5, Boston

Database System Technology
BERNSTEIN

November 4-6, San Francisco

Digital Image Processing
and Analysis

PRATT

November 16-18, Washington, D.C.

Computer Networks
KLEINROCK

November 17-19, San Francisco

DP APPLICATIONS

Capacity Planning

BUZEN, DENNING, SCHWETMAN

October 26-28, Washington, D.C.

Office Information Systems

CARLISLE, WATTEEUW

October 26-28, Washington, D.C.

November 30-December 2, San Francisco

Local Data Networks

SHOCH, WEIR, ROBERTS

November 9-11, Washington, D.C.

Integrated Distributed Systems
POPEK, KLINE

November 9-11, Sunnyvale

SNA

MARKOV, PIATKOWSKI

November 30-December 2,

Washington, D.C.

Software Engineering Economics

BOEHM

December 7-9, San Francisco

DP SPECIALTIES

Data Base — The Second Wave
HOLLAND

November 9-11, Chicago

December 7-9, Boston

X.25 and Other Protocol Interfaces
to Packet Switched Networks

KARP, WEIR

October 12-14, Boston

November 30-December 2, Sunnyvale

IBM and Your DP Strategy
LAMOND

November 30-December 3, Chicago

December 7-10, New York

FOR DETAILS CONTACT:

TECHNOLOGY
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INSTITUTE

741 10th ST., SANTA MONICA, CA 90402, (213) 394-8305

Data Base The Second Wave

3-Day Seminar

Nov. 9-11, 1981/Chicago

Dec. 7-9, 1981/Boston



Robert H. Holland

TECHNOLOGY
TRANSFER
INSTITUTE

741 10th ST., SANTA MONICA, CA 90402, (213) 394-8305

AUDIENCE

This seminar is intended for information resource managers, data processing managers, data base administrators, systems managers, data base managers, user managers, data administrators, and senior technical professionals. An understanding of data base and data processing concepts will be helpful.

TEXTBOOK

James Martin, *End-User Guide to Data Base*, Prentice-Hall, 1981.

DAY 1 Strategic Data Base Planning

SYLLABUS

- Defining and Managing the Plan
- Establishing Business Entities
- Developing the Strategic Data Model
- Developing the Data Base Plan
- Selecting Subject Data Bases
- Developing the Data Architecture
- Defining the Systems Architecture
- Implementing the Data Dictionary

PURPOSE

Successful implementers of data base technology have known where they wanted to go before they tried to get there. The seminar will show you how to develop an overall data and systems model of the organization so that such a road map can be provided. Important ingredients which include business modeling, information requirements, system dynamics, subject data bases, information center, and distributed processing will be fully integrated into the approach. Additional focus will be placed on how to sell top management on treating data as a corporate resource, and on data base planning.

DAY 2 Data Base Design Methods

SYLLABUS

- Logical Data Base Design
- Data Modeling and User Requirements
- Data Dictionary Validation
- Stability Analysis
- Normalized Data Base Design
- Relational Model
- Network (CODASYL) Model
- Hierarchical Model
- Automating the Design Process
- Physical Implications
- Comparing Data Base Management Systems

PURPOSE

Top-down planning for data base architectures must be quickly followed by highly productive implementations. In discussing data base design methods, we will match the top-down process of planning with the bottom-up process of implementing. Using the business model and data base blueprint, delegates to the seminar will discover how systems modules may be broken into six-month deliveries to end users. Particular attention will be paid to the development of normalized subject data bases to meet user requirements in a highly responsive environment. Attendees will also learn how to develop a migration plan from today's file data base, and packaged systems to tomorrow's data base plan.

Project teams may become highly productive through the utilization of automated design and data dictionary support. We will discuss the use of these tools in application development. Data base design topics will be enhanced by actual workshop examples that allow attendees to fully understand methods of implementation.

DAY 3 Information Resource Management

SYLLABUS

- Data Administration
 - Organizational Setting
 - Responsibilities
 - Tools and Techniques
 - Interface to Project Management
- Data Base Management
 - Management Responsibility
 - Interface to Data Administration
 - Logical to Physical Design
 - Implementing the Data Base Strata
- Future of Data Base
 - Distributed Data Base
 - Data Base Machines
 - Electronic Organization

PURPOSE

The electronic corporation of the 1980's requires continuous management of data as a resource of the company. Computing equipment, communication links, word processors, and office automation deal with the delivery of data. However, the data itself must be highly managed. Primary emphasis in the seminar will be given to the successful data management approaches in the industry.

Seminar delegates will be able to relate their own organizational setting to the need and establishment of the information management function. Emphasis on this topic will include how to convince top management of its importance as well as how to implement data resource management, data administration, and data base administration. Interfaces between systems analysis, data analysis, structured design, programming, and end user involvement will also be discussed.

In order to effectively manage the data resource, management must obtain a view toward the future. Attendees will achieve this view by seeing Dr. Holland review the available electronic technologies of today, and projecting them into a typical corporate profile within the next five years.

SEMINAR INFORMATION

FEE: \$695.00 (U.S. Dollars) for either three-day seminar. Fee includes:

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540 North Michigan Avenue
Chicago, Illinois 60611
(312) 836-0100
\$64 Single, \$76 Twin

Boston Marriott
Commonwealth Ave. at Route 128
Newton, Massachusetts 02166
(617) 969-100
\$80 Single, \$90 Twin

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CODE: 0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N

MANAGING THE DATA BASE ENVIRONMENT

The operational data structures that we find in most companies today have been built by highly skilled and technically oriented people during the first wave of data base. Unfortunately, these individuals have not spent enough time gaining an understanding of user requirements for data, or the associated structuring of data, to support multiple sets of applications, or subjects of concern, within the corporate setting. Instead, they have been adding applications and patching data bases together to meet immediate needs. Thus, in most corporations, we find very few data base management systems that are working in a user effective mode. Far greater productivity can be realized when these considerations are factored into the design from the beginning. The second wave of data base development will be characterized by the fully integrated data base environment.

Many hard lessons have been learned from the first wave of data base development, and the second wave must take advantage of such lessons. To meet this challenge, Dr. Robert Holland has designed a seminar for managers who are searching for an understanding of data base systems and for a means to design more efficient data base structures which will save time and personnel resources and lower future maintenance costs within their companies. Starting with the basic concepts of strategic planning of logical data base design, Dr. Holland will focus his presentation on specification of user requirements and automating the process for data base design. Special emphasis will be placed on structuring data in the most stable form and formulating strategies and methodologies that will result in successful management of the data base environment.

This seminar is designed to provide the participant with a solid foundation from which to manage the data base environment. An understanding of workable approaches to data base that yield a stable data resource will be required for the 1980s. In an age where conservation and productivity are requirements of the business and government communities, their data resources must be used more effectively than ever before. The means to effective data utilization may be accomplished through strategic data base planning, logical data base design, and fourth-generation data base languages. Participants will learn how to achieve strategic planning results, perform logical data base designs, and implement them through data administration and data base management functions. Related topics will cover how to implement data base designs into hierarchical, network, and relational DBMS data models.

Particular attention will be devoted to developing stable data structures through *normalization*. The normal forms of data will be presented with examples so that participants can fully understand the canonical synthesis process. Benefits of canonical synthesis will be discussed as well as detailed examples showing the automation of this process.

The future of data base technology will have an effect on the way in which organizations conduct business. The final topic of discussion will include future trends in data base, and how companies can take advantage of these trends to shape their data base destiny.

Attendees of Dr. Holland's past seminars have felt them to be the most contemporary offered in the industry today. His vast experience in sound implementations make the integrated methods that he presents uniquely credible. Solutions to many corporate data processing problems may be found through properly implementing the techniques discussed. Regardless of your phase of development, we know from past experience that from this seminar you will gain considerable insight into the development of your corporation's data base future.

ROBERT H. HOLLAND

Dr. Holland is best known for his pragmatic and academically sound systems design methodologies. Through his work with Fortune 500 companies, he has established proven approaches for data resource management, data base design, distributed processing, and systems and data planning architectures.

As president and chairman of Holland Systems Corporation, he directs all project resources and development methods. His other responsibilities include participating in the research, design, and development of the Holland Systems' family of proprietary software products for automating application designs.

Dr. Holland was formerly president of Database Design, Inc. where he developed data base design methodologies and was the main architect of its data base design software package known as DATA DESIGNER. This was the first of a new breed of software designed to automate the data base design process. Prior to this, Dr. Holland was the executive Vice President of the DMW Group, the world's largest independent telecommunications consulting firm. Here he not only directed all consulting project activities, but also was the chief architect of several command-driven software packages used for optimizing communication network designs. These packages are now offered through Tymshare Corporation's public network facilities, and have been used by many companies.

He served for a number of years as the Chairman of the Department of Information Systems and Director of the Information Systems Research Lab at Eastern Michigan University. Dr. Holland was also a systems engineer for Hercules, Inc. His degrees include a Bachelor's and Master's in Engineering, and a Ph.D. in Information Systems from Virginia Polytechnic Institute, where he was also an Associate Director of Computing.

Dr. Holland is widely published and has numerous articles in periodicals such as *Computerworld*, *Datamation*, and *Data Communications*. He is an international lecturer and is a regular speaker at the James Martin World Seminars.

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